Condensed Transcript

Deponent: George P. Smith, Ph.D. (05/14/02)

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF WASHINGTON, D.C.

MORPHOSYS AG,)
)
Plaintiff,)
)
vs.) Case No. 1:00CV00146
)
CAMBRIDGE ANTIBODY TECHNOLOGY)
LIMITED,)
)
Defendant.)

VIDEOTAPED DEPOSITION OF GEORGE P. SMITH, Ph.D., a witness, produced, sworn, and examined on Tuesday, May 14, 2002, between the hours of 11:00 a.m. and 6:00 p.m., at the law offices of Davis, Susan and Holder, 1001 Cherry Street, in the City of Columbia, County of Boone, State of Missouri, before

Sally Bredeman Harmon, CCR
BREDEMAN & ASSOCIATES, INC.
311 Jackson Street
Jefferson City, Missouri 65101

and a Notary Public within and for the State of Missouri, commissioned in Cole County, Missouri, on the part of the plaintiff, pursuant to notice.

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EXHIBIT INSTRUCTIONS:

Smith Deposition Exhibits Nos. 1 through 24 were retained by the reporter and are attached to the original transcript; copies were made and attached to Mr. Vezeau's copy of the transcript.

Defendant's Deposition Exhibits Nos. 313 through 321 were retained by the reporter and are attached to Mr. Vezeau's copy of the transcript; copies were made and attached to Mr. Harth's copy of the transcript.

Photocopies of Pope Deposition Exhibit No. 2, Kay Deposition Exhibits Nos. 20 and 24, and CAT 30(b)(6) Deposition Exhibits Nos. 22 and 26, and McCafferty Deposition Exhibit No. 13 were retained by the reporter and are attached to the original transcript; copies are attached to Mr. Vezeau's copy of the transcript.

SIGNATURE INSTRUCTIONS:

Signature requested; presentment waived; to be obtained by the reporter.

EXHIBITS

Exhibits (contd.) Marked

No. 9 - Document entitled "Significant Dates in G.P. Smith's Research with Genex's SCA," a summary that Smith submitted to the lawyers for Enzon in pursuant of the patent on single-chain antibodies (1 p) 54

No. 10 - Fax transmission cover sheet dated 1/22/91 sent to Carlos Barbas from Smith (1 pp); printout of an ELISA plate reader (1 p) 57

No. 11 - Document contained in a manila folder entitled "Banbury Conference 4/90": Handwritten notes for talking points (2 pp), and outline for talking points (1 p) 72

No. 12 - Document contained in a manila folder entitled "Banbury Conference 4/90": Schedule for a four-day meeting, Vectors For Cloning The Immune Response, 4/23 through 4/26 (1 p) 72

No. 13 - Document contained in a manila folder entitled "Banbury Conference 4/90": handwritten notes (4 pp) 72

No. 14 - Document contained in a manila folder entitled "Banbury Conference 4/90": List of Participants (3 pp) 72

No. 15 - Discovery documents M081888 - M081895: Summary of poster exhibit presented at Miami Winter Symposium 1/90 (8 pp) 83

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No. 19 - Discovery document C019044 - C019045: Set of protocols for how to use filamentous phage display vectors, cloning and fUSE vectors (2 pp) 94

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No. 22 - Discovery document M080566: Letter dated 2/24/94 to Bittner from Wanda Warddell, DHHS (1 p) 104

No. 23 - Discovery document CM040463: Facsimile Message dated 7/21/95 to Smith from Chiswell (1 p) 183

No. 24 - US Dept of Commerce, Patent and Trademark Office action document with attachments (16 pp) 184

Defendant's Deposition Exhibits:

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No. 314 - Discovery document M081978 - M091979: Facsimile dated 8/4/99 to Smith from Bernhard Virnekas (2 pp) 112

No. 315 - Facsimile transmission sheet dated 11/24/99, to Smith from Harth (1 p); Discovery documents M016440 - M016475: an opposition by MorphoSys in the European patent office (35 pp) 122

No. 316 - Facsimile transmission sheet dated 11/24/99 to Smith from Booth (1 p); US patent No. 5,580,717 (Dower, et al.) with attachments (22 pp) 125

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No. 319 - Discovery documents M011705 - M011706: Letter dated 6/27/97 to Dear Colleague from Smith (2 pp) 165

No. 320 - Discovery document 90 003254 - 90 003256: Facsimile cover sheet dated 3/25/98 to Jackson from Walton (1 pp); Letter dated 3/24/88 to Sean from Persson, with attachment (2 pp) 171

No. 321 - Review of the Breitling, et al., paper (1 pp) 177

McCafferty Deposition Exhibit:

No. 13 - Discovery documents M015566 - M015570: Excerpt from book entitled "Phage Display of Peptides and Proteins, A Laboratory Manual" (5 pp)

Pope Deposition Exhibit:

No. 2 - Discovery documents CM009441 - CM009516: DHHS Grant Application from Smith (76 pp)

Kay Deposition Exhibits:

No. 20 - Fascimile Messaged to Walton from McCafferty, with attachments (3 pp)

No. 24 - Discovery documents CM039756 - CM039760: Declaration of prefessor Brian K. Kay, Ph.D., in the matter of CAT, Ltd., and Medical Research Council, for a European patent (5 pp)

Exhibits (contd.) Marked

CAT 30(b)(6) Deposition Exhibits:

No. 22 - Discovery documents C017779 - C017782: Notes of Banbury Meeting, Cold Spring Harbor (3 pp

No. 26 - Discovery documents M015990 - M015993: Article from "Science" magazine: "Single-Chain Antigen-Binding Proteins" by Bird, et al. (4 pp)

PROCEEDINGS

MR. HARTH: Appearing for the manufacturer, MorphoSys: David Harth and Paul Booth.

MR. VEZEAU: And on behalf of Cambridge Antibody Technologies, I am Tim Verzeau. And with me are my colleagues Jane Choi and Dr. David Clough of the firm of Katten Muchin Zavis Rosenman.

MR. HOSKINS: And my name is Philip J. Hoskins. I appear here this morning on behalf of Marvin Wright, who was also subpoenaed to bring some documents at this time. I will state for the record that we have filed objections with Ms. Choi prior to the stated date and time for the production and that those objections have been timely filed with Ms. Choi, raising certain objections to the document request served upon Mr. Wright, the general counsel of the university.

Also in my capacity as an attorney with the Office of the General Counsel, I am appearing here today on behalf of the witness, Dr. George P. Smith.

GEORGE P. SMITH, Ph.D., being sworn by the Certified Reporter/Notary Public, testified as follows:

EXAMINATION BY MR. HARTH:

Q. Please state your full name.

A. George Pearson Smith,

THE WITNESS: Do you want "Pearson"?

THE REPORTER: P-e-a-r-s-o-n?

THE WITNESS: That's correct.

BY MR. HARTH:

Q. Where do you live, Dr. Smith?

A. 228 East Parkway Drive in Columbia.

Q. Columbia, Missouri?

A. Columbia, Missouri.

Q. How are you currently employed?

A. I am a professor at the University of Missouri in Columbia.

Q. In what department?

A. Division of biological sciences.

MR. HARTH: I'm going to ask you to mark this, please.

MR. VEZEAU: David, are you marking these as Smith exhibits?

MR. HARTH: Uh-huh.

(SMITH DEPOSITION EXHIBIT NO. 1 WAS MARKED FOR IDENTIFICATION BY THE REPORTER.)

BY MR. HARTH:

Q. I'm going to hand you, Dr. Smith, what the court reporter has marked as Smith Deposition Exhibit 1, which is a letter, and attached to that letter is a subpoena.

Did you receive this letter and this subpoena?

A. I'm sure I did. Yes, I did.

Q. And you'll note that attached to the subpoena there is an Exhibit A which contains a list of various documents that have been requested of you in connection with this deposition. Do you see that?

A. Yes. Exhibit A, yes.

Q. Have you searched through your files and produced to counsel for both sides documents that you believe are responsive to this document request in Exhibit A?

A. Yes, I have. I've -- most of them, at least.

Q. All right.

A. I have attempted to get what I have in my files.

MR. HARTH: And it's my understanding, Mr. Hoskins, that there are a few documents that originally were contained in Dr. Smith's files which the University of Missouri is asserting a privilege?

MR. HOSKINS: Well, I would say that the privilege is being asserted by Dr. Smith --

MR. HARTH: All right.

MR. HOSKINS: -- and by the university. I will identify those documents in some summary fashion for the record.

One document is a letter from Jorge Goldstein dated 10/8/91, the attorney who was prosecuting the patent

application. That letter is to George Smith, one of the co-inventors of the invention for which the patent was being sought.

The second is an undated handwritten note, appears to be from Dr. Smith to Connie -- the last name isn't given; I believe that to be Connie Armentrout -- the university patent administrator at the time, detailing a conversation that Dr. Smith had with me as counsel for the university regarding a research contract being negotiated between the university and an entity known as Genex Corporation.

The third is a memo, dated 5/16/90, from Connie Armentrout to me, Phillip Hoskins, as the attorney for the university, asking certain legal questions regarding terms and conditions of that contract under negotiation.

The fourth item is a memorandum from Connie Armentrout to George Smith, dated June 5, 1990, detailing her conversation with me about the terms and conditions of the proposed research agreement between Genex Corporation and the University of Missouri.

As to those four items, they were contained originally in the files of Dr. Smith. The university and Dr. Smith are asserting an attorney-client privilege as to those documents.

MR. HARTH: Mr. Hoskins, I would ask that you

retain those four documents for the -- at least for the near future so that they will be accessible if either side or both sides cares to pursue the matter through the court.

MR. HOSKINS: I will represent for the record that I have received your request, intend to follow it, and will retain those four documents in my files so that if a court subsequently orders production of those documents, we may do so.

MR. HARTH: Thank you. I appreciate that.

MR. VEZEAU: May I clarify one date?

MR. HOSKINS: Sure.

MR. VEZEAU: On the first document that you identified, Phil, that you are withholding on the basis of privilege, you said the date was 10/8/91. Do I understand correctly that the date is the 8th of October of 1991?

MR. HOSKINS: That's correct. It is October 8, 1991.

MR. VEZEAU: And that's the letter from Jorge Goldstein to Dr. Smith?

MR. HOSKINS: That's correct. And I might add that there is a voluminous attachment to that two-page letter that I believe also is covered by the attorney-client privilege in that it is communications either to Dr. Smith from Goldstein or comments from doctor -- from Goldstein to Dr. Smith, either of which would be covered by the

privilege, it's our position.

MR. VEZEAU: Would you please identify the nature of those documents attached to the letter?

MR. HOSKINS: It's a -- the document is entitled "Comments on Continuation In Part of Serial Number 07/680,009" filed April 2, 1991. I haven't counted the pages, but it certainly is multiple -- a multiple-page document. It may in fact be a duplicate of the original letter and attachment. But I'm going to estimate it's about a half-inch thick. If you'd like to number the pages, we can do that.

MR. VEZEAU: No, but can you tell us how many pages were comments by Dr. Smith as opposed to materials sent to Dr. Smith?

THE WITNESS: You might have a hard time doing this.

MR. HOSKINS: If I could have a moment --

MR. VEZEAU: Sure, absolutely.

MR. HOSKINS: -- to confer with Dr. Smith, I think I can.

MR. VEZEAU: Sure.

THE WITNESS: It looks like the --

MR. HOSKINS: We'll do it quietly off the record.

MR. HARMON: We're off the record?

MR. VEZEAU: (Nodding head.)

MR. HARTH: Why don't we go off the record.

(Discussion off the record.)

MR. VEZEAU: Back on the record.

MR. HARMON: We're back on record.

MR. HOSKINS: Okay. This is Phil Hoskins. I'd like to state for the record, I have examined closely the October 8, 1991, letter from Jorge Goldstein to Dr. Smith and attachments thereto. The total pages of the attachments to that two-page letter are five pages prior to a document entitled "Title of the Invention," stamped "Draft," and which contains a total of 63 pages, including the exhibits at the end.

Dr. Smith is going to now tell you on what pages of that attachment "Title of the Invention" his comments appear.

THE WITNESS: Page 1, page 2, page 3, page 8, page 9, page 11, page 12, page 13, page 14, page 15, page 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 29. There are two page 29s. So there are two page 29s, both of which have comments on them. Page 30, page 31, page 32, page 34, page 35, page 36, page 38, page 39, page 40, page 42, page 43, page 45, 46, 47, forty --

MR. HOSKINS: That has no page number, I

guess, but it's figure 1.

THE WITNESS: -- figure 1 following page 52, figure 4 following page 52. And that's all.

MR. HOSKINS: And for further clarity of the record, I'd like to state that although the numbers I gave you previously were assuming that the pages were sequentially numbered and there were not duplicate pages, that appears not to be the case. There are some duplicate page numbers and there are some page numbers that seem to be omitted throughout the document, so that the total of the attachments to that October 8, 1991, letter may be slightly different from those indicated previously.

MR. HARTH: Thank you, Mr. Hoskins.

Do you have anything further at this time, Mr. Verzeau?

MR. VEZEAU: No.

MR. HARTH: Let me ask you a couple of follow-up questions so we can try to get this housekeeping all out of the way at the beginning.

Mr. Hoskins, has the university produced any additional documents in compliance with the subpoena that was served by Cambridge Antibody Technology?

MR. HOSKINS: It has produced no documents today. It has, as I indicated earlier, submitted in a timely manner, objections to that subpoena raising certain

objections.
I believe, as to some of the categories of items in the subpoena, there will be no responsive documents within the possession, custody, or control of the university.
As to others, there will be some documents that are responsive, some of which will be privileged in the nature of attorney-client privilege; others of which may be privileged in the sense of they may contain trade secrets or other confidential information of a research, development, or commercial interest to the university. But those documents do exist.
As to item 4 of the subpoena served upon Mr. Wright -- that's Marvin E. "Bunky" Wright -- I will say that item No. 4 is a very broad and expansive request, the exact nature of the documents responsive to which we don't yet known and it will take a considerable period of time to gather those documents.
MR. VEZEAU: I believe you indicated off the record that you thought that might take a couple of weeks?
MR. HOSKINS: Yes, that's correct. If we're ordered to produce those and have to go to the time and expense of doing that, I think it will take a couple of weeks before the documents can be gathered, reviewed, and identified as those privileged documents that exist in that

document.
MR. VEZEAU: My understanding was you were going to take a look in the areas that you felt they would be found, and do a reasonable search. Are you saying now that you're not going to do that?
MR. HOSKINS: As to items 1, 2, and 3 of the subpoena, I believe that's already been done.
MR. VEZEAU: Okay.
MR. HOSKINS: We have done a reasonable search. We believe we have the documents either in combination with what Dr. Smith has produced that arguably might be within the possession, custody, and control of the university, and from other offices of the university.
As to item 4, it's so broad and expansive, we have done no search of those -- for those documents, believing it could not be accomplished by today's date for production of those documents, and opted instead to file the objections.
MR. VEZEAU: Are you going to do a search?
MR. HOSKINS: I think that remains to be seen. I'm not making a commitment to do that broad and expansive search unless we can reach some agreement on narrowing it or somehow subsidizing the expense involved for the university in doing such a search or pursuant to a court order that says we should do that.

MR. VEZEAU: Thank you.
MR. HARTH: As to the non-privileged documents that are responsive to items 1, 2, and 3, when will those be produced?
MR. HOSKINS: Well, again, we've objected to the entire subpoena. Those -- I have no plan right now to produce those documents until such time as either an agreement is reached with counsel for Cambridge Antibody Technology or until such time as a court orders us to do so.
BY MR. HARTH:
Q. And, Dr. Smith, have you brought any additional documents with you today?
A. Beyond what the -- I showed you yesterday, no. So you've seen all the documents that I have produced in response to the subpoena.
Q. All right. How old a man are you?
A. 61.
Q. How long have you been a professor at the University of Missouri?
A. Since 1975.
Q. Did you happen to bring a CV with you today?
A. No.
Q. Do you have a CV?
A. Yes.
Q. Would you be agreeable to providing both counsel

with a copy of that CV --
A. Yes.
Q. -- when we're through with the deposition?
A. Yes.
Q. Are you an inventor on any issued patents?
A. Yes.
Q. Can you identify those patents?
A. I am an inventor on -- I don't know what the title is, but it's a display of conopeptides on phage. So it's an issued patent. And I am afraid I didn't bring the patent number.
Q. All right. So there's -- that's one patent?
A. Yes.
Q. And that's the only one?
A. I believe that's the only one.
Q. Who is Jorge Goldstein, to your understanding?
A. He's an attorney for the -- attorney for the company, Enzon, that was pursuing the patent originally filed by Genex Corporation for single-chain antibodies -- display of single-chain antibodies on living organisms. I'm not sure exactly what their wording was, but it was a patent application that arguably could be phage display of antibodies, could cover that field.
Q. At some time were you named or added as an inventor on that enzyme application?

A. Yes, I was. I was -- I don't know what the legal term was, but the invention was enlarged in some way to include me as a co-inventor.
Q. And was it your belief that Mr. Goldstein was representing you personally in connection with that enzyme application?
A. Me personally? No. I think he was representing the company.
MR. VEZEAU: Would you, David, clarify what company?
BY MR. HARTH:
Q. What company are you talking about?
A. Enzon.
THE REPORTER: Do you know how to spell that, Doctor?
THE WITNESS: E-n-z-o-n.
BY MR. HARTH:
Q. Dr. Smith, I'm going to hand you a document that was previously marked as McCafferty Deposition Exhibit 13, the first page of which is a copy of the cover page of a book entitled "Phage Display of Peptides and Proteins, A Laboratory Manual."
Are you familiar with that book?
A. Yes.
Q. What was your connection with the book "Phage

Display of Peptides and Proteins"?
A. I wrote a preface or introduction. I forgot what it was called.
Q. Can you confirm that the -- I think it's called a foreword.
A. Foreword.
Q. Can you confirm that attached to McCafferty Deposition Exhibit 13 is the foreword that you wrote?
A. Yes.
Q. I'm going to ask you some questions about that foreword and about the events that you talk about in that foreword.
On the very first page, in the second paragraph, you talk about phage display having "its genesis in May 1984." Do you see that?
A. Yes.
Q. I wonder if you could describe for us, in your own words, what happened in May of 1984 that you consider to be the genesis of phage display?
A. Well, I had been working on sabbatical in Bob Webster's lab at the department of biochemistry in -- at Duke University. And I had been doing a number of experiments with filamentous phage, which was his specialty and which I had come to work on as well.
And the -- among the things that I was doing was

making modifications to one of the coat protein genes of filamentous phage called gene III. And because that coat protein seemed to tolerate many large modifications, I thought that it would be possible to put some foreign piece of protein from some completely different source into that coat protein so that it was displayed on the surface of the filamentous phage.
And there -- I -- there was a suitable vector that had encoded a foreign protein being worked on in that department. And I took a piece from that vector that encoded a part of that foreign protein; start with a couple of pieces --
THE REPORTER: Are you saying "foreign" protein?
THE WITNESS: Foreign protein. Foreign.
BY MR. HARTH:
Q. Do you remember what that foreign protein was?
A. EcoRI endonuclease. That's capital E, little "c," little "o," capital R, capital I as a Roman numeral.
Q. Okay. What did you do with that EcoRI endonucleus that --
A. Endonuclease.
Q. -- endonuclease that was available to you at Dr. Webster's lab?
A. The gene for that protein was cloned, and I took

pieces of the gene that specified pieces of the endonuclease and inserted them into the coat protein gene, the so-called gene III of filamentous phage.
And then demonstrated in a somewhat indirect method that those pieces of the foreign protein, that EcoRI endonuclease, were indeed displayed on the phage.
Q. Did you publish a paper on that work?
A. Yes. In 1985, a paper in "Science" magazine.
MR. HARTH: Would you mark this as Exhibit 2, please.
(SMITH DEPOSITION EXHIBIT NO. 2 WAS MARKED FOR IDENTIFICAION BY THE REPORTER.)

BY MR. HARTH:
Q. I'm handing you what we have marked as Smith Deposition Exhibit 2. Is that the article that you published in "Science"?
A. Yes.
Q. And this article describes your insertion of the foreign -- the gene for the foreign protein into the gene for gene III and the display of that protein on --
A. Yes.
Q. -- the phage?
A. Yes.
Q. Now, in your foreword, you say that by 1988 Steve

Parmley, a graduate student in your lab, had developed a practical display vector and a very effective affinity selection method.

What was that practical display vector that you're referring to in the foreword?

A. Well, there were a series of vectors. They were called fUSE vectors.

So that's spelled lower case "f" and then upper case U-S-E.

And there were a series of them that he constructed. But basically they were the same type of vector.

And they put -- they put a cloning site, which is a site for a restriction endonuclease, that was unique in the whole virus chromosome, in a suitable place in the filamentous phage gene III. This is the gene for the coat protein into which we were displaying foreign domains.

So it would have been similar to the original experiments that I did in Webster's lab. But, here, that cloning site made the display easier to do and also put the foreign domain in a different location in the coat protein.

Q. What was that location?

A. The original work in Webster's lab put the foreign domain roughly in the middle of the protein. Steve Parmley's work tried a number of locations, but the one that

seemed to work the best by his criteria was putting the foreign domain at the N. terminus, the beginning of the protein.

Q. Did Dr. Parmley's work involve what is known as a phagemid?

A. Parmley tried a number of types of vectors, one of which was a series of phagemid vectors called pIG3 vectors.

So that's lower case "p," capital I, capital G, and then the numeral 3.

These were standard phagemids, which was a well-developed technology at the time. But they had, in addition to the standard features of a phagemid, they had a copy of the -- a modified version of the gene III protein.

Q. How was the gene III protein modified in this phagemid?

A. The phagemid had a modified gene III protein that had a suitable, a convenient cloning site, as we call it, a restriction site that was unique in the whole construct and it allowed foreign domains to be easily -- the coding sequence for foreign domains to be easily inserted into the vector at that point.

Q. All right. And was Dr. Parmley able to successfully display proteins or peptides on -- using these phagemids?

A. Yes.

MR. VEZEAU: Objection, lack of foundation and alternative.

BY MR. HARTH:

Q. Let me ask it this way. Was Dr. Parmley able to display anything using a phagemid system?

A. Yes.

Q. What was it that he was able to display?

A. Can I give an answer that I'm not a hundred percent sure of?

Q. Go ahead.

A. I believe it was pieces of the E. coli lacZ gene that encodes a protein called Beta-galactosidase. I do have the books, but -- so I'd have to look at them to be sure of that.

Q. Okay. What books do you mean?

A. Well, maybe his lab books. But his thesis is here, and it may be in that thesis.

Q. All right.

A. I actually can't remember whether that work on phagemid is in his thesis.

Q. Can you also describe, at least in general terms, the very effective affinity selection method that you refer to in the foreword?

A. The general idea is to start with some binding protein or binding entity, such as an antibody -- in his

case it was an antibody -- and immobilize it onto a surface. In his case it was just the surface of a plastic petri dish. And then expose that surface to a mixture of bacteria phage, filamentous bacteria phage.

A tiny number of the phage would be phage displaying a foreign domain that the antibody recognizes. And the vast bulk of the phage would be phage that don't display that domain, empty phage.

And after exposing that surface, then the surface is washed so anything that is not bound to the surface is removed. And the phage that were bound by the antibody would be retained.

Then what he showed was that the phage that bound were overwhelmingly the phage that displayed the foreign domain recognized by the antibody.

Whereas, the background phage, which were overwhelmingly numerous in the initial mixture of phage, were mostly gone. That was the -- what ultimate -- he called it biopanning, but ultimately this came to be called affinity selection.

Q. Now, you describe lunch on January 19, 1988, as an epiphany. Why was that?

A. I was visiting the malaria group at the National Institutes of Health and two of the young workers there. Vidal de la Cruz and Tom McCutchan, who was his supervisor

who had invited me there, were telling me about some work of Mario Geysen.
THE WITNESS: Do you want the spelling?
THE REPORTER: Uh-huh.
THE WITNESS: Mario is M-a-r-i-o. And Geysen is G-e-y-s-e-n.
A. Mario Geysen had made libraries, random libraries, of peptides by chemical means.
And the gist of the conversation between Vidal, Tom, and me was essentially the same experiments of making libraries could be done with filamentous phage.
And although Mario Geysen developed clever techniques for surveying/screening his chemical libraries of peptides for peptides that would bind to some target protein such as an antibody, phage display would make that much easier and make it possible to survey libraries many orders of magnitude larger.
That was the general gist of that conversation.
Q. And did you come up with a term for that idea?
A. Ultimately, we called it an epitope library. I'm actually not sure of what -- I don't know if I had a term at the time.
Q. But in your later work when you're talking about epitope libraries, that refers back to that lunch in January of --

A. Yes.
Q. -- nineteen --
A. '88.
Q. -- eighty-eight?
And did you, in fact, publish later in 1988 on this idea of an epitope library?
A. Steve Parmley and I published a paper in "Gene" around the summer of 1988. And that paper detailed Steve's work on developing display vectors, especially the fUSE vectors.
But it contained in it, I think in the discussion section -- I haven't read the paper in awhile, but it's probably in the discussion section -- a short, speculative sentence to the effect that this could be used to display random peptides that we would call -- what we would call an epitope library.
Q. At that point you had not actually created an epitope library?
A. No. We were trying to, but as of that point -- well, I don't -- I'm not sure, actually. I'm not sure exactly about the timing here.
(SMITH DEPOSITION EXHIBIT NO. 3 WAS MARKED FOR IDENTIFICATION BY THE REPORTER.)

BY MR. HARTH:

Q. Let me show you what we've marked as Smith Deposition Exhibit No. 3. Is this a copy of the article in "Gene" by Dr. Parmley and yourself that you were just referring to?
A. Yes. I see that I got the date slightly wrong, so it's late in nineteen -- published late in 1988.
Q. All right.
A. This is the right paper.
Q. Did you submit a grant application to the National Institute of Health in 1988 with respect to seeking funding for work on this epitope library idea?
A. Yes.
Q. I'm going to show you what was previously marked as Pope Deposition Exhibit 2, which is in fact two documents. And if you would look, you'll see the very first page of this document is marked CM 009441, and if we go through until you get to CM 009480. I want to ask you about that section of this exhibit.
A. Okay.
Q. Do these pages from Pope Deposition Exhibit 2, that is CM 009441 through CM 009480 -- what are those pages? What is that section?
A. That is a grant proposal -- actually could I --
Q. Yeah, take your time and make sure you're sure.
A. This is a grant proposal that was submitted in

1987.
Q. 1987?
A. Yes. The beginning funding date is 4/1/88, but the submission -- I'm afraid I didn't bring my folder on this grant proposal. But the submission would have been July or June of '87 probably. I believe that's when you would have to submit for a 4/1/88 --
Q. All right.
A. -- starting date. And this covers the idea of what we were calling fusion phage at the time. I presented it as a continuation of our work on filamentous phage physiology, but it does not, I believe -- I can't imagine it would cover the epitope library concept because it was submitted before January of 1988.
Q. All right.
A. And I don't see any reference to the epitope library.
Q. All right. If you'll then continue with this document, starting on CM 009481 and continuing to the end of the document, what is that?
A. This is a submission -- it's a resubmission of a proposal for a grant to support research on what I'm now calling filamentous fusion phage.
So in contrast to the previous proposal that was part of this exhibit, the focus of this is entirely on

filamentous fusion phage rather than on phage physiology in general.

And this covers the -- this proposal covers the concept of the epitope library, as did its predecessor. This is a resubmission of a proposal that was not funded. And the -- it also covers the concept of infectious libraries -- of infectious antibodies, which would now be called phage antibodies.

Q. What was the date this grant application starting on 9/4/81 was submitted?

A. The deadline for this submission was 11/1/1988. I have looked for documentation of this, but I know that I -- I don't know, but I'm pretty sure that I submitted a few modified pages of this documentation. And the modifications had to do with what we would now call phage antibodies. That would have been -- those modifications would have been at 11/1/88 or no more than a day or two after that.

Q. And does the copy of the grant application starting at 9481, does that have the modified pages?

A. Yes. It is the modified pages. And I have sought in vain for the proposal that was originally submitted.

Q. All right. So the proposal with the modified pages was submitted on November 1, 1988?

MR. VEZEAU: Objection, leading, lack of foundation.

BY MR. HARTH:

Q. When was the modified proposal submitted?

A. I cannot find records of that, but within a day or two of 11/1/88 is my best of my recollection.

Q. Now, you say that the 11/1/88 grant application was a resubmission of an earlier application. Was that earlier application the application that constitutes the first half of Pope Exhibit 2?

A. No. There was one in between.

Q. There was one in between, all right.

A. And it would have had the title Filamentous Fusion Phage rather than the title Filamentous Phage Physiology.

Q. Do you know when that in-between grant was submitted?

A. Let me calculate.

I'm not sure, but my guess is March of 1988, early in 1988. I don't remember the NIH deadlines then.

Q. And do you still have a copy of that earlier in-between grant application?

A. Yes. I didn't bring it with me.

Q. All right.

A. I'm sure I do.

Q. All right. I'm going to request that you provide both sides with a copy of that. This is now the second request I've made from you. And I'll keep track of it.

We'll send you and Mr. Hoskins a letter following the deposition reiterating these requests.

Do you recall why it was -- let me step back.

Was the application that you've identified as being submitted around July of 1987 that starts at 9441 at the beginning of Pope Exhibit 2, was that grant funded?

A. No.

Q. And was the in-between grant that you think was filed about March of 1988 funded?

A. No.

Q. Do you recall the reasons why that March 1988 grant was not funded?

A. I have -- the introduction to the grant that was submitted 11/1/88 is a rebuttal of those -- of the criticisms of the previous proposal.

Q. Could you just identify the Bates number of --

A. The --

Q. -- where that starts?

A. -- CM number?

Q. Yes.

A. The CM number of the introduction is CM 9491 through 9492. So there were -- the objections had to do with construction of libraries that I regarded as a misunderstanding of "construction of libraries."

Q. So that March of 1988 grant did include the idea

of the epitope libraries?

A. Yes, it included the idea of an epitope library.

Q. Did it include the idea of phage antibodies?

A. No.

Q. And that was added to the proposal --

A. The resubmission --

Q. -- the resubmission?

A. -- contained a proposal of phage -- what now would be called phage antibodies.

Q. All right.

A. So the objections had to do with the library construction, that affinity purification didn't represent a technological advance, about whether peptides would be efficiently displayed, about folding of peptides displayed on phage, and then about the quality of the peptide ligands that would emerge from the proposed affinity selection procedures.

And that's -- at least those are the criticisms that I responded to.

Q. All right. In the foreword to "Phage Display of Peptides and Proteins," you talk about how, "In October of 1988, while preparing to resubmit my NIH proposal...I happened to read the 'Science' article by Bird, et al., on single-chain antibodies, I was inspired by a new vision."

I'm going to ask you to first look at what was

marked at a previous deposition as CAT 30(b)(6) Exhibit 26 and ask you whether this is a copy of the article by Dr. Bird that you were referring to in your foreword?

A. Yes, this was the article.

Q. And describe for us in your own words the new vision that came to you upon reading that, the Bird article.

A. This article by Bird, et al., describes making an engineered version of an antibody which pares the antibody molecule down to kind of the minimal structure that could be expected to have the specific binding properties of a whole antibody.

So the pared-down protein is called a single-chain antibody. It has several other names as well. And it is about 200 -- a little bit more than 200 amino acids long, roughly 110 amino acids of heavy chain, 110 amino acids of light chain: the two chains that make up natural antibodies. But just the 110 amino acids of the two chains that actually have the binding structures that bind specifically to antigen, and then they're connected by a linker.

And the vision was that this would be potentially a molecule that was simple enough to display on filamentous phage. And that if that could be accomplished and the protein retained its ability to bind specifically to antigen, then ultimately it might be possible to construct

what I -- in my own terminology at the time, I called it a paratope library that was analogous to the epitope library.

So an epitope library was a huge array of peptides displayed on filamentous phage. And some of those peptides might be expected to bind to any particular target antibody.

The paratope library concept would reverse the roles of epitope and paratope. Paratope was the name for the pared-down antibody. You'd have a very large library of pared-down antibodies or paratopes displayed on filamentous phage.

And the user could put -- use any antigen of interest and use that antigen to select out of that huge library of displayed-on-phage those few pared-down antibodies, those few single-chain antibodies or paratopes, as I called them, that would bind to their particular antigen.

So this would be a way of obtaining monoclonal antibodies that didn't involve animals or culturing animal cells in vitro. That would be a micro -- a simple microbiological procedure for making antibodies.

Q. Did you envision using the biopanning method that we've talked about in connection with this?

MR. VEZEAU: Objection, leading.

BY MR. HARTH:

Q. How did you envision being able to select the

paratopes or single-chain fragments of interest?

MR. VEZEAU: Objection, lack of foundation.

BY MR. HARTH:

Q. You can answer.

A. I envisioned using affinity selection or, quotes, biopanning. The idea would be the same as we envisioned in the case of -- the same as Steve Parmley had demonstrated.

The target antigen would be immobilized on a plastic surface. And the library of phage displaying pared-down antibodies would be exposed -- the surface would be exposed to that library, and those phage that display a single-chain antibody or paratope or pared-down antibody that would bind to the antigen would be retained on the surface. And other phage-displaying antibodies that don't bind to the antigen would be washed away. And then what remained on the plate would be eluted and would represent the antibodies of interest.

MR. HARTH: All right. Why don't we take a short break. I want to get some of the copies that have been made. I see that they're back in the room. And we usually take a break every 80 or 90 minutes or so. Let's do that now and in ten minutes we'll pick it up again.

(Recess.)

(SMITH DEPOSITION EXHIBIT NO. 4 WAS MARKED FOR IDENTIFICATION BY THE REPORTER.)

MR. HARMON: Back on record.

BY MR. HARTH:

Q. Dr. Smith, you previously testified that you have incorporated this new vision concerning phage antibodies into your November 1, 1988, grant proposal. And I'd simply like you to confirm that Smith Deposition Exhibit 4, which is a copy taken from your files, is indeed that grant application.

MR. VEZEAU: Can you give us a second so we can see if we can find the same document?

MR. HARTH: It's right at the end.

MR. VEZEAU: Okay. Thank you.

THE WITNESS: What was the question?

BY MR. HARTH:

Q. The question is, is Smith Deposition Exhibit 4 a copy of your November 1, 1988, NIH grant application taken from your file?

A. Yes.

(SMITH DEPOSITION EXHIBIT NO. 5 WAS MARKED FOR IDENTIFICATION BY THE REPORTER.)

BY MR. HARTH:

Q. I'd now like to hand you what we've marked as Smith Deposition Exhibit 5, which is a copy of another

document taken from your files.
MR. VEZEAU: May we see that, please?
MR. HARTH: Toward the front.
MR. VEZEAU: Thank you.
BY MR. HARTH:
Q. Can you identify this document?
A. This is an application for a National Research Service Award, would be a senior -- well, you might call it a fellowship, to spend a year working with Genex on -- just make sure that this is the one that I think it is -- with Genex Corporation on developing the concept of an epitope library -- I'm sorry, of a phage antibody library, what we called a paratope library.
Q. What was the date of this application?
MR. VEZEAU: Objection, lack of foundation.
BY MR. HARTH:
A. Am I supposed --
Q. You can answer, yes.
A. I believe the deadline was January of '89. I have down the -- in the signature space, the date is -- I haven't got my signature there, but the date I've written in as January 2, 1989. And I believe that I typed this front page personally.
Q. Did you actually submit this application?
A. Yes. It was not -- it was not accepted.

Q. All right. It was not accepted in what sense?
A. Not in the sense that they did not, did not accept this proposal and review it.
Q. Because it was late?
MR. VEZEAU: Objection, leading.
BY MR. HARTH:
Q. Why was that?
A. The reason was that the letters of recommendation, according to new rules that I was not aware of, had to be, I believe it was, part of the application. It was something to do with the letters of recommendation that had to support this proposal. So it was not accepted for review by NIH.
Q. Was the NIH application, Smith Deposition Exhibit 4, granted?
A. Yes, that was funded.
(SMITH DEPOSITION EXHIBIT NO. 6 WAS MARKED FOR IDENTIFICATION BY THE REPORTER.)

BY MR. HARTH:
Q. I'm handing you what we've marked as Smith Deposition Exhibit 6. What is that document?
A. This is called the summary statement or in sort of a jargon, the pink sheet. It is a critique summarizing -- a critique of the proposal, summarizing the comments of the study section. And then that's followed by just a list of

the members of the study section and the officers from NIH that ran the study section.
Q. When were you informed that the grant had been accepted?
A. I can just give you a rough time. My guess would be the middle of April of '89. I know that the study section met -- it's the February/March study section, series of study sections. I don't know exactly when they met.
I see a note up here on the top that says M.Z. 4/14/89. My guess is that was Marian Zatzman, who was the program officer for the agency that would be administering this proposal.
So my guess is that it went through her office then, so I would probably have gotten it soon after that. She was was very expeditious about sending out her resumes, her summary statements.
Q. Were you required to respond to the pink sheet, Exhibit 6?
A. Apart from saying "hooray"? No.
Q. Did you learn from this pink sheet that the grant had been accepted or --
A. I learned that the grant was -- well, if you'll look on the first page, it received a priority score of 130 and a percentile rating of 6.3. And that was clearly going to be in the funding zone for this round of NIH

funding.
So that meant -- this is not a formal notification of funding; but to all intents and purposes, it meant I was going to be funded.
Q. Were you in fact funded?
A. Yes.
Q. What was the effective date of the grant?
A. Of the starting of the grant?
Q. (Nodding head.)
A. I believe as the requested date, which would have been 7/1/89 -- that is July 1, 1989. I think that's when it started.
Q. You stated that the single-chain antibody fragments discussed in the Bird article typically are in the realm of 200 amino acids long?
A. Well, it's --
MR. VEZEAU: Objection, lack of foundation.
For your information, I will state objections on the record. I don't know if you've been in a deposition before.
THE WITNESS: (Shaking head.)
MR. VEZEAU: But those are for the judge to rule on. If I think a question -- and David will do it when I question you -- is improper, I'll state my objection. And that's for the court to rule on.

Certainly, if you can answer the question and you know the answer, you should. So I hope my objections don't upset you. It's not intended really for you as an audience.

THE WITNESS: I understand.

MR. VEZEAU: Okay.

BY MR. HARTH:

A. About 230, 250 amino acids.

Q. All right. How many base pairs would that be?

A. The number of base pairs in the coding sequence is three times of the number of amino acids, so that would be about 750 amino acids -- 700 to 750, in that region.

MR. VEZEAU: You said amino acids. Did you mean base pairs?

THE WITNESS: Sorry.

BY MR. HARTH:

A. The number of base pairs is three times the number of amino acids. So the number of base pairs would have been 700 to 750 or so.

Q. I'm going to ask you to take another look at Smith Deposition Exhibit 3, which is the Parmley and Smith article in "Gene."

A. Yes.

Q. Would you look at page 315 of that article, which also has a Bates stamp number in the lower right-hand corner

of M O11627? Do you have that?

A. Yes.

Q. And if you'll look in the upper left-hand corner of that page, starting five lines down, the following statement is made: "These results demonstrate the ability of fUSE vectors to accept inserts up to 335 bp" --

What does "bp" stand for?

A. Base pairs.

Q. -- parentheses perhaps more parentheses and express the foreign aa" --

Which means...?

A. Amino acid. Amino acids.

Q. -- "encoded in the inserts on the surface of the virion"?

A. VEER-e-on.

Q. VEER-e-on. "Some inserts by their very nature will affect pIII function. Inserts that contain anchor domains or other hydrophobic segments may stop transfer of pIII into the host membrane" -- citing Davis and Model, 1985 -- "and presumably would not be tolerated. Inserts that exceed 335 base pairs may lead to excessive breakdown of the fusion protein or otherwise impair pIII function, so for the time being we recommend using fragments of 100 to 300 base pairs."

Did I read that correctly?

A. Yes.

Q. How did you think you could achieve the display of phage antibodies as described in your November 1, 1988, grant application when those fragments would be somewhere in the neighborhood of 675 base pairs, when in an article that you had published earlier in the year, you had stated that inserts that exceed 335 base pairs may lead to excessive breakdown and recommended using fragments of 100 to 300 base pair?

MR. VEZEAU: Objection, lack of foundation and misstates the witness's testimony as to the number of base pairs. You said 650.

BY MR. HARTH:

Q. And you said...?

A. I think I said around 700 to 750.

Q. All right. But the point is that the antibody fragments that Bird was talking about were significantly more than 335 base pairs, correct?

A. Yes.

Q. And so how was it that you thought you could display single chain fragments of 700 or 750 base pairs in light of the statement that I just read you from the "Gene" article?

A. The reservations that Steve Parmley and I expressed in that "Gene" paper that you just quoted from

weren't meant to be formal or strict guidelines. They were very informal recommendations.

And at the time we did not -- we did not realize that there would be a strong motivation for considering much larger inserts. When the Bird, et al., paper became -- when I became aware of the Bird, et al., paper that you've already mentioned, that provided a strong motivation for considering much larger inserts. And certainly at the time I did not consider that, our recommendation against longer inserts, to be deterrent to considering the much larger inserts that would be required for a phage antibody library as we would now call it --

MR. VEZEAU: Would you --

A. -- display of phage on -- display of antibodies on phage.

MR. VEZEAU: Would you mark that portion of the transcript so I can come back to that? Will you be able to do that?

THE REPORTER: (Nodding head.)

MR. VEZEAU: Thank you.

MR. HARTH: Would you mark this, please.

BY MR. HARTH:

A. Shall I continue this answer?

Q. Yes, please.

A. There were also, as I tried to spell out in the

grant proposal submitted November 1, '88, there were some considerations about single-chain domains, single-chain antibodies, that might make it a little easier because -- than a -- rant (phonetic) of most inserts of that size because it was reasonable to expect it would be a folded domain.

And a folded domain would be more likely, we thought, to survive degradation in the relevant compartment of the cell, which is the periplasm. So that they might be a particularly favorable case for displaying large domains than an average, randomly chosen segment of the amino acids of the same length.

MR. HARTH: Would you mark this, please?

(SMITH DEPOSITIN EXHIBIT NO. 7 WAS MARKED FOR IDENTIFICATION BY THE REPORTER.)

BY MR. HARTH:

Q. Let me hand you what we've marked as Smith Deposition Exhibit No. 7, which is a copy of a paper by Skerra, S-k-e-r-r-a, and Pluckthun, P-l-u-c-k-t-h-u-n, entitled "Assembly of a Functional Immunoglobulin Fe Fragment in E. coli," which was published in "Science." Are you familiar with this paper?

A. Yes, I -- yes, I know about this paper. You asked "familiar." This is not a paper that I read every comma of

deeply. But I -- in a general way, I was acquainted with this paper.

Q. And did you become acquainted with this paper when it came out or thereabouts?

A. I can't answer that question. I would -- my guess is that I was, but I don't know. I can't -- I can't certify. And I have as far as I know, I have not quoted -- not cited it anywhere.

Q. All right. Did this paper have any effect on your thinking about the ability of antibody fragments to fold properly in periplasmic space?

MR. VEZEAU: Objection, lack of foundation and leading.

BY MR. HARTH:

A. I -- at least indirectly it did because it was part of the growing field of showing successes in in vitro expression of antibodies.

And if I -- if this paper did not directly influence what I was thinking at the time, indirectly I was aware of the field. I was aware of the field, the successes of the field. They were pretty well publicized.

So I can say with a fair amount of assurance that this paper at least indirectly influenced my thinking. And whether the paper itself did, I can't answer, as I've said.

Q. As a recipient of an NIH grant, were you required

to report periodically to the NIH on your progress?

MR. VEZEAU: Objection, lack of foundation as to who the recipient was.

BY MR. HARTH:

A. Yes. Any recipient of a NIH grant has to apply for what's called a noncompeting continuation, which would include a short progress report; and at the end of the granting period, either submit a competitive renewal proposal, which would include a summary of what you did in the previous -- under the previous grant period, or a final report.

Q. At the end of the grant period?

A. Right. They have to have a final report either as a final report itself or as the progress report for a competitive renewal proposal.

Q. All right.

MR. HARTH: Would you mark this, please?

(SMITH DEPOSITION EXHIBIT NO. 8 WAS MARKED FOR IDENTIFICATION BY THE REPORTER.)

BY MR. HARTH:

Q. Would you look at what we have marked as Smith Deposition Exhibit 8 and tell me whether you can identify that document?

A. This is the noncompeting and continuation

application so, technically, it's termed Application for Continuation Grant.

And it would request period -- funding for the 7/1/91 to 6/30/92 year of the grant, which would be -- so that would be year 3. Let's see. '89 to '90, '90 to '91. Yes. So it would be request for the year 3 and would summarize progress in year 2.

Q. All right. And as part of this continuation application, did you summarize your progress for the previous year?

A. Yes.

Q. Where does that appear in this document?

A. Which page numbers do you want me to give you, the MO page numbers?

Q. Yes, why don't do you that.

A. Okay. The MO page numbers are 80550 to 80552.

Q. And that section of the continuation application reports on progress made during what period?

A. That would be from July 1st -- actually -- so that would be July 1, 1990, to June 30, 1991.

Q. All right. I want to call your attention to page number MO80552. The first full paragraph on that page -- one, two, three -- seven lines down, there is a sentence that reads: "We ourselves have constructed a phage displaying a single-chain anti-fluorescein antibody exactly

as planned in the original grant proposal."
Do you see that?
A. Yes.
Q. The original grant proposal was which?
A. That was the proposal that was submitted 11/1/88.
Q. And had you in fact, during this time period, constructed a phage that displayed an anti-fluorescein antibody on its surface?
A. Yes. A graduate student named Ned Watson, in my lab, had constructed -- made this construct with the anti-fluorescein single-chain antibody, which was the one that was described in the Bird, et al., paper that you have already referred to.
Q. When did Ned Watson accomplish this?
A. I can't tell you exactly because I no longer have the notebooks covering that period, but the -- I'm pretty sure he started in the fall, possibly late summer of 1990. And I'm pretty sure he was basically finished by Christmas of 1990.
MR. VEZEAU: Objection, pure speculation. By the way, your notes are in the pile of documents you gave us, your own chronology, so you might want to refer to that.
THE WITNESS: Thank you. I have a chronology in there?
MR. VEZEAU: Yes. I assume it's your

handwriting, maybe someone else's, but it was in your files.
MR. HARTH: Let's mark it as an exhibit.
(SMITH DEPOSITION EXHIBIT NO. 9 WAS MARKED FOR IDENTIFICATION BY THE REPORTER.)

BY MR. HARTH:
Q. I'm going to hand you what we've marked as Smith Exhibit 9. What is that this document?
A. My -- I'm not sure. But my guess is that this is a summary of significant dates that I submitted to the lawyers for Enzon in pursuant of the patent on single-chain antibodies. And it's a copy of that.
And it's accompanied -- the original accompanied notebooks covering this work that I sent to that -- to those lawyers. Those notebooks got lost in the mail. We have never seen them since.
So this would have been sometime in nineteen -- end of 1991, beginning of 1992 or something like that. I'm not sure when I sent those documents, those notebooks.
But I see that my memory is not correct here because if we look at August 25, 1990, that's when Ned Watson first started, or close to when he first started, working on these -- on this display. So he demonstrated inserts August 25, 1990. And I give a reference to page number in his notebook I called NED-1.

Q. All right.
A. And it wasn't until February 1, according to this. I did not remember this correctly, but it wasn't until February 1 that we did the specific binding assays. And that refers to a page number. Again, these -- neither of these two lab books is available anymore.
Q. When did Ned Watson work in your lab?
A. Well, obviously it was before August 25, 1990, because he'd done a few experiments beforehand. So I guess it must have been in the -- earlier in the summer of that year. He was doing a rotation, which meant a few months of work in the laboratory just seeing how the laboratory is.
And I don't know when he stopped. My recollection was the end of December, but I think that may well be wrong now because it's not likely he would have started, say, beginning of August and worked all the way through the end of December on a rotation. So I'm not sure actually when he worked in the laboratory.
And that would mean that the -- if I'm correct about that, the experiments demonstrating binding on February 1, 1991, would have had to be -- would have had to be done by me using his constructs.
Q. Do you know what the reference "RDE" refers to?
A. RDE is a name of a lab book. And so RD refers to Robert Davis. He's my chief technician. And E would be

book E of his books. And 65 would refer to the page number in that book.
So my guess is that he did at least some of the manipulations for this experiment; otherwise, it wouldn't be in his book. If I did everything, it would be in another book like SE or SF; S for Smith and then a letter designation.
Q. All right. Is Exhibit 9 in your handwriting?
A. Yes, that's my handwriting.
Q. And did you prepare Exhibit 9 with reference to the laboratory notebooks that are referenced? Did you have those in front of you --
A. Yes.
Q. -- when you did this?
A. Yes. It was a guide to significant dates.
Q. The second entry, is that May 2 or May 21?
A. May 21, 1990. Again, I'm really not remembering correctly here.
Q. Do you know where Ned Watson is today?
A. No, but I could find out. He elected to go with another professor for his Ph.D. and that professor is here, so I can find out where Ned is.
Q. All right. We'd appreciate that, and we'll put that in your letter.
A. Okay.

Q. Is Robert Davis still with you?
A. Yes.
Q. At the time that Ned Watson was doing this work, where was he in his schooling?
A. A beginning graduate student, within the first year or year and a half, sometimes will take courses of course, but also do what are called -- what we call rotations and what are called rotations in most graduate programs, I believe.
So these are periods of, typically, two, three, sometimes four months where the student will do a small project in a professor's laboratory, get to know the laboratory. And this is designed to help a student make up his or her mind about which laboratory he is going to choose do the Ph.D. project in.
Q. All right. Did Mr. Watson do this work on his own?
A. No. No. This -- he did the physical work all on his own. But certainly in any rotation, the student is new to the system, so he would have daily, daily consultation.
Q. Do you know how the single-chain inserts were identified on August 25, 1990, by what technique?
A. No, I can't tell you. It would be speculative.
MR. HARTH: Would you mark this, please.
(SMITH DEPOSITION EXHIBIT NO. 10 WAS MARKED

FOR IDENTIFICATION BY THE REPORTER.)

BY MR. HARTH:
Q. Let me hand you what we've marked as Smith Deposition Exhibit 10 --
MR. VEZEAU: Thank you.
Q. -- and I'm going to ask whether you can identify this document?
A. Yes. This was -- I was communicating with Carlos Barbas at Scripps, who was also interested in display of antibodies. And this was probably -- this is a fax to Carlos dated 1/22/91.
And I believe this would be just a few days after I returned from a visit to that laboratory. Carlos Barbas is in the laboratory of Richard Lerner. So to Richard Lerner and Carlos Barbas. And I believe Dennis Burton was there, and Angray Kang. At least Andre Kahn and Carlos Barbas. And we had sort of talked about problems of phage antibodies.
Q. What is it on the second page that you faxed to Dr. Barbas?
A. Well, this is a -- I would have to sit down to tell you exactly. But what -- the printout here is a printout of a so-called ELISA plate reader which reads the amount of signal of some kind of -- generated from some kind

of entity that's bound to a surface-immobilized ligand.
So if the format is a 96-well so-called ELISA dish made out of polystyrene plastic, in each well you immobilize some target. And then each well is filled with something that might potentially bind to that target.
The wells are washed, and then in some way you detect the binding by some suitable technique that generates color. And the plate reader is basically a color reader. It reads the amount of color.
So if you look up in the -- the upper leftmost number is .6. That's an optical density of .609. That's an optical density of .609, which would represent sort of a relatively strong color. This was probably yellow or green. I think probably green. It ought to be a fairly intense green color.
Those .033 at the lower, at the bottom of the left column would be something that your eye wouldn't detect as color probably. But I would have to look at this more carefully to tell you exactly what all these entries are.
Q. All right. Does -- do these ELISA results have any connection to the first experiment demonstrating specific binding, which is referenced on Smith Exhibit 9?
A. Yes. It's -- let's see if there is a date on this, on these results. Obviously, the results were obtained before 1/22/91. This would be one of the results

that were leading to what I regarded on February 1, '91, as actually, as an experiment demonstrating specific binding.
I don't think this itself was the, what I regard as the definitive experiment. Partly I've got all these other controls.
I'd have to look at the structure of this to deconstruct this. It would take me awhile. I'd probably need a hour at least to tell you exactly what's going on in this experiment.
All I can say is I don't think that this was the first experiment demonstrating specific binding that I referred to, though possibly I have the dates wrong. That February 1, 1991, might be wrong. This could be the experiment that I was referring to there, but I don't think so.
Q. Was the experiment that you were referring to in Exhibit 9 an ELISA experiment?
A. I'm not sure. It probably was, but I'm not sure without seeing -- without being able to see the notebook, I won't be able to tell you that.
Q. Do you know who did the ELISA testing that is -- the results of which are shown on Exhibit 10?
A. I don't know for sure. I would imagine that I at least did some of the actual manipulations. But Robert Davis, my technician, might have done some of the sort of

preliminary work with them and might have washed the plate or something like that, washed the ELISA dish.
Q. On your chronology you indicate that plasmid pGX5420 was received from Genex on May 21, 1990. Do you see that?
A. Yes.
Q. What was the significance of receiving that plasmid from Genex with respect to your work?
A. GX5420, I'm almost certain, is the plasmid that encodes the fluorescein single-chain antibody -- the anti-fluorescein single-chain antibody that Bird, et al., described.
Q. And that was the antibody that was inserted into the phage?
A. Yes.
Q. Was it a whole phage that was utilized here or was it a phagemid?
A. This is a phage. It was -- the vector was fUSE 5, which is a phage vector.
Q. When did you first start talking to Genex about obtaining the anti-fluorescein antibody fragment from Dr. Bird?
A. I can't give you an exact date, but I'm pretty sure it was the very end of October of 1988.
Let me see if there is a -- may I refer to Exhibit

4, the grant proposal? Page 31 of that proposal is a Note on Collaboration with Robert Bird. "Robert Bird of Genex Corporation intends to collaborate with me on the cloning of single-chain antibodies into fusion phage --
THE REPORTER: Please slow down.
THE WITNESS: Oh, I'm sorry.
THE REPORTER: "Intends to collaborate with me..."
A. "...on the cloning of single-chain antibodies into fusion phage; he will supply the gene and help me characterize the binding properties of the phage."
Q. Okay.
A. So it would have had -- I would have had to talk to him, and this is also my memory, right away after reading his paper. The paper is in an issue of "Science" dated 21 October 1988. And we would have gotten it October 26 or seventh or something like that; you know, five, six days later than the publication date.
Q. What accounts for the time that elapsed between your first talking to Dr. Bird about obtaining a clone of his single chain in late October of 1988 and your actual receipt of plasmid pGX5420 on May 21, 1990, some 18 months later?
A. The negotiations between the University of Missouri and Genex were very problematical.

Q. How so?
A. There were many details that Genex required, several aspects of it -- I'm not going to be a hundred percent sure of my memory here, but this is my recollection as best I can remember.
There were several details and provisions that they required that were hard to meet. We had many letters going back and forth. I met with them there, including their chief counsel.
And it just turned out to be very difficult to get them to agree to this collaboration. And I guess maybe from their point of view, it was difficult for them to get the university to agree to what they wanted.
Q. Did the university and Genex and yourself eventually agree on the terms of the collaboration?
A. Can I consult with --
Phil, do you know?
MR. HOSKINS: No, I don't.
A. I believe we did, yes. I believe we came to an agreement.
Q. Would that have been sometime before May 21, 1990?
MR. VEZEAU: Objection, lack of foundation
BY MR. HARTH:
A. I'm actually not sure.
Q. How was it that you physically obtained the

plasmid that had the single chain?
A. I don't know. My recollection was that I got it at a meeting a month earlier than this. And I didn't, evidently. So it must have come in the mail is my guess.
Q. Now, between the time that you submitted your grant proposal in early November 1988 and February 1, 1991, when you performed the first experiment demonstrating specific binding, did you make any attempt to keep secret your idea for displaying single chain on phage or the work that you were doing to accomplish that?
MR. VEZEAU: May I get the question back, please?
(The reporter read the last question.)
A. Not that I remember. I do know that I talked about it quite freely in a number of instances. For example, a departmental seminar, I believe I talked about it, about this -- that concept of what is now called phage antibodies, sometime in 1989 probably.
Q. Who attends these departmental seminars?
A. Our department. So this would be post-doc graduate students and faculty from our department.
Q. All right.
A. The division of biological sciences.
And I talked about it at a -- the only public time that I talked about it in that time that I can remember

specifically is a Banbury Conference in 1990. That would have been in April of 1990.
Q. Where was that held?
A. Banbury, Long Island in New York.
Q. Did you give a formal talk at that conference, the Banbury Conference?
A. No. Banbury conferences don't have formal talks. But I did give a talk, yes.
Q. All right. And what was the substance of that talk?
A. The idea, the -- if I could just refresh my memory here. The title of Banbury Conference was Vectors For Cloning the Immune Response. And the burden of my talk was to describe the concept -- no experiments, obviously, at that time, but the concept of what we called the paratope library or what we would now call phage antibody libraries.
Q. Now, you have referred to some documents in a folder?
A. Yes.
Q. Is this a folder that you have kept involving the Banbury Conference?
A. Yes.
Q. Do you have any notes of your talk at the conference?
A. I won't be able to answer that question

defintively. But these two pages are, I believe, my talking notes.
Q. All right.
A. They certainly look -- these are exactly like the talking notes that I traditionally made in those days.
Q. All right. Could I see your folder?
A. Yes.
MR. HARTH: Have you seen this, counsel?
MR. HOSKINS: No.
MR. HARTH: Why don't you take a look.
MR. HOSKINS: There's no attorney-client communications in there?
THE WITNESS: No.
MR. HARMON: Do you want to take a short break?
MR. HARTH: Yeah, why don't we go off the record.
(Recess.)

MR. HARMON: This is tape 2. Back on record.
MR. HOSKINS: Yes. I'd like to state for the record, make a few statements related to the subpoena served on Mr. Wright by Ms. Choi and the party she represents in this matter.
First of all, speaking to the Exhibit A to

that subpoena calling for Mr. Wright to produce four categories of documents, and I have some response to each of those categories for the record so that both the parties will know at what stage in the process of gathering these records the university is.
As to item 1, it's my belief after searching, or asking others to search at my request, those offices of the university most likely to have any such documents described in item 1, that the university has no such documents responsive to that, with the exception of whatever documents Dr. Smith has in his files related to that.
As to item 2, after checking with those offices most likely to have any requests for a copy of that grant application, it's my belief that the university in fact has no documents evidencing or indicating that there's been a prior -- any request prior to July 10, 1991, for copies of that document under the Freedom of Information Act.
As to item 3, I think that there are documents not only in Dr. Smith's files, but documents within the files of the office of technology transfer and special projects that may be responsive to that request. All of those documents may in fact be duplicates of those documents contained in Dr. Smith's file, but I have not yet had an opportunity to compare those and cannot state with

certainty that existing documents responsive to item 3 are all duplicates of what you've seen from Dr. Smith's files.
As to item 4, no effort has been made by the university to this stage in trying to identify all U.S. or foreign patents or pending patent applications which have been funded in whole or an in part by NIH grants from all of its employees on all of its campuses and without regard to date.
That was perceived by me to be a burdensome and expensive task and prompted -- was in large measure responsible for prompting the objections to the subpoena and the submittal of those objections today to Ms. Choi prior to the eleven o'clock deadline for producing those documents, rather than undertaking that burdensome and expensive task.
I might say also that some of the items which I have seen and which are responsive to Exhibit 3 are believed by me and by Mr. Wright to be privileged communications between attorneys and clients.
And in addition to that, some of those documents are believed by me to be -- contain trade secrets or other confidential information of a research, development or commercial basis; and, therefore, deemed, in my review of those documents, deemed confidential and privileged and not subject to disclosure.
Is there anything else?

MR. VEZEAU: Yeah, let me, Phil, to clarify on 3, it seems to me you're saying there are such documents but you believe they're privileged. Is that correct?
MR. HOSKINS: I don't want to leave the impression that I believe all of the documents responsive to No. 3 are privileged. I believe that some of the documents responsive to No. 3 are privileged. And I believe that I've received copies of those documents from the office of technology transfer and special projects.
They may or may not be entirely duplicative of records available through Dr. Smith's files. I have not yet had an opportunity to compare those documents. But I certainly know there are documents responsive to No. 3 found in files other than Dr. Smith's which are not privileged or claim to be privileged. That's the extent --
MR. VEZEAU: Wait. There are documents that you're not claiming are privileged; is that correct?
MR. HOSKINS: There are documents responsive to item No. 3 that I believe are not within any privilege.
MR. VEZEAU: Okay. But you are not producing any or --
MR. HOSKINS: No, none were produced today.
MR. VEZEAU: Okay. Will you be producing those that you don't deem to be privileged?
MR. HOSKINS: If we can reach agreement or if

by order of the court we're compelled to do so, we will. We're exercising our rights under Rule 45(c) to object rather than produce those documents.
MR. VEZEAU: I understand. All right. Well, Jane will certainly be in touch with you and see if there's something we can work out.
MR. HOSKINS: Okay.
MR. VEZEAU: Thank you.
MR. HARTH: And there are no documents responsive to No. 2 that you're aware of?
MR. HOSKINS: There are no documents responsive to No. 2 that I'm aware of, having checked with those offices of the University of Missouri-Columbia where those documents are most likely to exist.
MR. HARTH: And is the same true for category No. 1?
MR. HOSKINS: It's my belief, having checked with those offices most likely to have those documents, that there are none that exist other than those which have been produced to you by Dr. Smith.
MR. HARTH: Thank you.
Mr. Hoskins, Dr. Smith just produced a manila folder entitled "Banbury 4/90, Cloning Immune Response." And as part of that file, there are nine slides. Will you take custody of these slides and at our expense have these

slides blown up onto paper copies?
MR. HOSKINS: Do you have any objection to that?
THE WITNESS: Oh, of course not.
MR. HOSKINS: Sure, I'll do that.
MR. HARTH: Is that acceptable to you? I'm trying to find a way to have a neutral third party take control of these slides and provide both sides with readable copies.
MR. VEZEAU: That's -- well, I don't know that I have any basis to say one thing or another. I don't know what you mean by "acceptable," candidly. You said you were paying for it. That's always nice!
MR. HARTH: All right.
MR. BOOTH: We'll send you the bill, though!
MR. HOSKINS: Now, one more thing for the record. I'm going to indicate for purposes of the record, it's approximately 1:30 p.m. I'm going to have to leave this deposition. And you have my permission to continue in my absence with Dr. Smith.
And I have instructed him that if he runs into a question and he needs to seek legal advice in the middle, he may take time and call me for that consultation.
MR. HARTH: Absolutely.
MR. HOSKINS: Nice to meet you-all.

MR. VEZEAU: Thank you.
Dr. Smith, I also -- your counsel is leaving, but I don't know that we told you at the beginning of this, this is not -- I know it's -- you're very kind putting in a long day. But when you feel you need a break, you take it. You just tell us and we'll take time for it.
THE WITNESS: (Nodding head.)
(SMITH DEPOSITION EXHIBITS NOS. 11, 12, 13, and 14 WERE MARKED FOR IDENTIFICATION BY THE REPORTER.)

BY MR. HARTH:
Q. Dr. Smith, I'm going to hand you what the court reporter has just marked as Smith Deposition Exhibit Nos. 11, 12, 13, and 14. I'm going to hand you these exhibits, and the first thing I'd like to ask you is to confirm that these exhibits are copies, photocopies, of papers that were contained in the manila folder entitled "Banbury Conference 4/90" that you handed us right before the break?
MR. VEZEAU: But before you do that, may we see that so we can conform our copies to these -- no, the marked exhibits, so we can conform our copies? May we use your stapler, David? Thank you.
That's 14?
MS. CHOI: Uh-huh.
THE WITNESS: Can you repeat the question?

MR. HARTH: No, but she can.
(The reporter read the last question as follows:
"QUESTION: Dr. Smith, I'm going to hand you what the court reporter has just marked as Smith Deposition Exhibit Nos. 11, 12, 13, and 14. I hand you these exhibits, and the first thing I'd like to ask you is to confirm that these exhibits are copies, photocopies, of papers that were contained in the manila folder entitled "Banbury Conference 4/90" that you handed us right before the break?")
BY MR. HARTH:
A. That's correct.
Q. Where did -- where did you obtain the original manila file from that you brought today?
A. My filing cabinet.
Q. And I think you said before the break that it was your belief that Exhibit 11 contained the talking points of your informal talk at that 4/90 Banbury Conference?
A. The first two pages of Exhibit 11 would be my talking notes.
Q. All right. And what is the third page?
A. On the third page it looks like that is a, sort of an outline, an earlier version of the talking notes. And then -- so that would be the first third of that page.
And then underneath were notes from the meeting,

from someone named Chaudhary that was -- who talked at that meeting. So this was not really a very -- I just scribbled those notes on the bottom of this page that had previously used for -- as a -- to make an outline for the talk.
Q. All right. In looking at the first two pages, the talking points, a number of the points have the word "slide" to the right-hand. Do you see that?
A. Yes.
Q. What does that refer to?
A. That refers to the fact that there is a slide associated with that talking point.
Q. And were those the slides that we just entrusted to Mr. Hoskins?
A. The slides that you entrusted to Mr. Hoskins, I would have to look in detail but probably included these slides that are referred to here.
Q. All right.
A. And I would imagine they have other -- there are other slides as well.
Q. Let's go through these talking points. And I'd like you to elaborate to the extent you can what you were speaking of. The first topic is fusion phage.
MR. VEZEAU: May I -- may I suggest that this is going to be quite confused, David, until you establish, one, recollection; and, two, if there's no recollection,

then let's makes sense.
MR. HARTH: All right.
BY MR. HARTH:
Q. Have you had a chance to review these talking points?
A. Yes, briefly.
Q. All right. And do these points on Exhibit 11 conform to your recollection of what you discussed at this meeting?
A. Yes, they do.
Q. Turning to the first point, fusion phage, what were discussing there?
A. This is a general description of the idea of what is now called phage display. So that would describe how foreign domains are displayed, fused to gene III protein on the surface of filamentous phage.
And it says that as a preview -- as sort of an introduction of what's going to be talked about later, that among the things that I would like to display, that I wanted to display, were single-chain antibodies. And that a library displaying single-chain antibodies would be called the paratope library.
But that first I was going to describe in a simpler system how phage display could be used in the context of an epitope library.

Q. And that's your second point?
A. So the second talking -- the second main heading was description of what an epitope library is.
Q. Why is Jimmy Scott's name --
A. Jamie Scott --
Q. -- boxed?
A. Jamie Scott was the post-doc in my lab who was primarily responsible for the epitope library project. And she was the one that constructed this epitope library.
Q. So you were giving her credit --
A. Yes, of course.
Q. -- mentioning her?
A. Right, yes.
Q. And then you also talked about biopanning?
A. Biopanning is the term that was used then for affinity selection. And I credited Steve Parmley, who was the graduate student in my laboratory who had worked out that technology. So this -- under this heading, the general idea of biopanning or affinity selection was described.
Q. All right. And what is the next heading? What does that refer to?
A. This is monoclonal antibodies A and M. These are two monoclonal antibodies from Lerner's lab at Scripps. Terry Fieser is the scientist there who developed these monoclonal antibodies. They were elicited by a protein

called myohemerythrin. And they're specific for a small segment of that protein, an epitope, with the amino acid sequence DFLEKI. That's what that DFLEKI refers to.

And then it goes on to describe what happened when the epitope library that would contain a huge array of six amino acid peptides, DFLEKI possibly being among them, was affinity selected with these two monoclonal antibodies.

And the burden of the result was that they had in common the DFL part of DFLEKI, although they differed in other positions. But they were clearly related to the DFLEKI epitope that originally elicited those antibodies.

Q. All right.

A. So this is describing what we regarded as a success of the -- of epitope libraries.

Q. All right. And then the next topic is paratope library. Will you tell us what you spoke about with respect to paratope libraries?

A. Well, this part of the talk was the guts of the talk, but it's entirely speculative. Paratope, as I have said before, was a term for pared-down antibody. A single chain antibody where you've sort of eliminated all the parts of the antibody that aren't necessary to make the specific binding contacts with the epitope on the antigen.

And so I -- this is a description of the idea of what now would be called a phage antibody. So that's, I

guess, the guts or the gist of this segment of the talk.

Q. How long did you talk?

A. Oh, the talks are maybe 15 to 20 minutes. I think this was about 15 minutes. And there were five minutes of questions.

Q. You have a question: "Will it fold right?" What did you mean by that?

A. Well, the -- as Steve Parmley and I had shown in the 1988 paper, large inserts, large peptide inserts or peptides displayed on phage can be degraded. So we were worried. I bought up as an issue in displaying single-chain antibodies on phage that they may be subject to degradation and may not fold correctly.

So the question of whether they would fold correctly was one of the issues that needed to be confronted in the design of what we were calling a paratope library.

And I started by describing the protein on which foreign domains are displayed, the pIII protein went through the membrane. Although the word isn't down here, I would have described it was in the periplasm. The periplasm was an oxidizing environment that would be favorable for folding, correct folding, of disulphide-bonded protein like a single-chain antibody.

And then I mentioned under that same heading that

if anybody wouldn't fold, it would be possible to potentially try to renature the antibody because the phage were resistant to 6M urea at low pH, which would be conditions that could allow the antibody chain to unfold. And then by gradually allowing it to refold, potentially you could restore binding activity to the antibody. This is a hedge here, that second point.

Q. What about the next sub point degradation in periplasm?

A. The burden of that argument was that mal-folded proteins are vigorously degraded in the periplasm, which has potent proteases. And I made the point that this is probably desirable for this system because any antibody chain that -- any single-chain antibody that didn't succeed in folding correctly probably would be degraded and lost, so it wouldn't be a sticky piece of protein that might give rise to a high background of sticky non-specific binding.

Q. There's someone's name at the very bottom of the page: Kathy...?

A. Strauch. She was, I believe, a post-doc in John Beckwith's lab at Harvard. And she was the person that had cloned and characterized periplasmic proteases in E. coli.

Q. All right. And then on the second page of Exhibit 11 there are a few more notations. Could you take us through those?

A. Okay. The first one says Interference dash Trypsin, and I don't know what I was talking about.

Q. All right.

A. Got me.

"In Vitro Evolution" referred to the idea that if a single-chain antibody wouldn't fold very well on phage, maybe you could mutagenize it in parts that don't have to do with its specific binding to antigen to make it work better in this context.

You could sort of adapt the single-chain antibody frame -- the framework part, as it's called, the part that doesn't actually make the specific contacts with antigen, but that sort of holds the whole structure together so those contacts can be made.

The idea was you might evolve those so that it would adapt it to this unusual -- a sort of unusual environment that differs from the natural way that antibodies are produced in the mammalian cells inside the body.

Q. What about "Making the Library"?

A. Okay. So I'm drawing a distinction here between a model involving one particular single-chain antibody. In our case, we were thinking of the fluorescein, the anti-fluorescein antibody that Genex had converted into a single-chain antibody.

Experiments involving one single antibody and showing that that could be displayed and could have its binding properties from making a library that would be billions of different single-chain antibodies with different binding specificities.

And the -- under Making the Library, the subheading "Degenerate Synthetic Oligos" referred to the idea that perhaps you could substitute for the short regions of antibodies that actually are responsible -- mostly responsible for specificity -- they're called complementary determining regions or CDR's -- perhaps you could make artificial antibodies that would have just random amino acid sequences in that region encoded by random oligonucleotides coding sequences that you can make chemically.

That's what that referred to. That was my conception of what a phage antibody library might look like.

Q. Do you recall whether you got any questions?

A. I recall that I got questions, but I don't know what they were.

Q. Okay. That was 14 years ago, so...

What is Smith Exhibit 12?

A. This is a schedule for the meeting. But what I don't know here is whether this is the final schedule or just a preliminary version that Juan Wikowski (phonetic) sent to the participants. But it's a schedule of where the

various sessions will be held.

Q. Do you recall at which session you gave your talk?

A. No.

Q. What is Smith Exhibit 13?

A. These are notes from the meeting. But I'm really -- the first part of this is rather formal. So if we -- let's see, if we -- the first two pages of this are rather formal. This is not my style of writing notes, so I'm, I'm not sure what these are.

Q. And how about Exhibit 14, what is that?

A. Let me take a minute to look through it.

This is a list of the participants with their addresses. I was hesitating because I think that -- I just wanted to make sure this is the final list of participants, and I believe this is the final list of participants.

Q. Did all the participants attend all of the sessions, or were there breakouts, or how did that work?

A. No, there were no breakouts. I, of course, couldn't tell you whether all participants went to all sessions. But, certainly, most participants went to most sessions because there wasn't anything else to do.

Q. All right. How many people do you remember being present for your talk, approximately?

MR. VEZEAU: Objection, lack of foundation.

BY MR. HARTH:

A. I can't visualize it.

Q. All right.

A. Twenty or more, let's put it that way.

Q. As I recall the testimony you -- well, strike that.

Did you have any private conversations with various participants during the course of this meeting?

A. Certainly.

Q. And isn't that one of the purposes of these Banbury conferences, to permit private conversations between participants?

MR. VEZEAU: Objection --

A. Yes.

MR. VEZEAU: -- leading.

BY MR. HARTH:

Q. Do you recall having any private conversations at the Banbury Conference with respect to phage antibodies?

A. I would have a hard time remembering specific conversations. I can't imagine I didn't, but I can't recall specific conversations.

Q. All right.

(SMITH DEPOSITION EXHIBIT NO. 15 WAS MARKED FOR IDENTIFICATION BY THE REPORTER.)

BY MR. HARTH:

Q. Let me show you what we've marked as Smith Exhibit 15 and ask whether you recognize that document?

A. This is, I guess, a summary of a poster exhibit that Jamie Scott gave at the -- Jamie Scott, who was a post-doc in my lab at the time, working on what we called the epitope library -- that she gave at the Miami Winter Symposium. I guess she gave it on January 25 of 1990.

Q. Did you attend that symposium?

A. No.

Q. But Dr. Scott did?

A. Yes.

Q. Would you look at page M081890, page headed "Introduction"?

A. Yes.

Q. And the last paragraph reads as follows: "The study presented here serves as a model system to test whether monoclonal antibodies, which are known to bind a number of related hexapeptide sequences, will do so when they are displayed as part of a fUSE phage coat."

Do you see that?

A. Yes.

Q. The sentence is, at least to me, ambiguous as to what "they" refers to on the second line from the bottom. That is, whether it refers to monoclonal Abs or hexapeptide sequences.

A. "They" there refers to hexapeptide sequences.
Q. Did Jamie Scott ever tell you that she told Cesar Milstein about your single-chain antibody idea at the Miami Symposium?
MR. VEZEAU: Objection, lack of foundation and leading.
BY MR. HARTH:
A. Yes.
Q. What did she tell you?
A. I can't remember exactly. She just said that she had talked to Cesar Milstein about the idea of a phage antibody, what now are called phage antibodies.
Q. Did she tell you what his reaction or response was?
MR. VEZEAU: Objection, lack of foundation and hearsay.
BY MR. HARTH:
A. I can't remember.
Q. Do you recall whether she mentioned talking to anyone else at the Miami Symposium about phage antibodies?
A. No, I can't remember anyone else.
Q. William Dower's name appears on the poster paper, Smith Exhibit 15. Was he involved in your work at this time?
A. We -- I've got to tell you that I'm not sure why

his name is on this abstract. But in a general way, we certainly cooperated with their group; for example, by supplying the vector parent for phage display that they used as well as we used. I mean, they made their own vector from it. The parent was a phage construct called fd Tet. And we talked on the phone. In a general way, we cooperated with Bill Dower.
Q. Are you saying that Bill Dower or Affymax supplied you with fd Tet?
A. Oh, no, we supplied him with fd Tet.
Q. Okay.
A. But, as I said, I don't know why he's on here because generally we hadn't formally -- he hadn't been a formal member of -- you know, like authorship. I'm not sure why he's on this poster. I don't recollect.
Q. Did you ever discuss with William Dower phage antibodies?
A. I don't know. I don't remember.
Q. Did you ever discuss phage antibodies with Dr. Bird?
A. Doctor...?
Q. Dr. Bird?
A. Dr. Bird?
Q. Yeah.
A. Oh, yeah. Oh, yes.

Q. And you say you called him right after you read his article?
A. Yes.
Q. Did you tell him about your idea during that first call?
A. Yes.
Q. And there were subsequent discussions with him?
A. Yes.
MR. HARTH: Would you make this, please.
(SMITH DEPOSITION EXHIBIT NO. 16 WAS MARKED FOR IDENTIFICATION BY THE REPORTER.)

BY MR. HARTH:
Q. I've handed you Smith Exhibit 16. Do you recognize that document?
A. I believe this is just a summary of my schedule of a visit that I had to Genex Corporation.
Q. When was that visit?
A. Well, this memo is dated January 5, 1989. And that would make sense as to when I got there, when I went there. I don't have independent verification of the time.
Q. All right. Do you remember making a visit to Genex?
A. Oh, yes.
Q. Where is Genex located?

A. It's in, I guess -- well, at that time it was in Bethesda or Gaitherburg. Gaithersburg, probably, something like that. Around Washington, D.C.
Q. Did you address a group while you were at Genex?
A. I don't recall. I don't think so, but I don't know for sure.
Q. The exhibit has you meeting with different people on the half hour.
A. Uh-huh.
Q. Do you remember doing that?
A. Yes.
Q. The exhibit also says that you are going to be here -- "here" being Genex -- "to discuss the possibility of expressing a single-chain antibody as part of a phage coat protein." Do you see that?
A. Yes.
Q. And did you in fact discuss that topic while you were at Genex?
A. Yes.
Q. What do you remember discussing in that regard?
MR. VEZEAU: Objection, lack of foundation.
BY MR. HARTH:
A. Well, the things I can specifically remember is talking with Ann Rose about what kinds of commercial, you know, patent protection agreements and things would have to

be put in place. She was the person responsible for that aspect of the company.
Q. Put in place in order to do what?
A. In order to -- for the company and the University of Missouri to collaborate on this research.
That was maybe the first time I talked to her.
And then I certainly talked with Bob Bird at length about, you know, how you would design a vector. Maybe we -- I -- it would be speculation. I'm not -- I do know we definitely talked about, in some detail, about how you would design a phage display of their single-chain antibody.
Q. All right.
A. So I -- and I'm afraid that I can't remember specifically what we talked about in the other meetings that we had there.
Q. Were there other meetings?
A. No, this -- I believe I met with all these people --
Q. Oh, I see what you're saying.
A. -- that are on the schedule.
Q. All right. Was there any agreement, confidentiality agreement or otherwise, in place with Genex prior to your trip there in January?
A. I don't know.

MR. VEZEAU: There is an agreement in the --
THE WITNESS: Maybe you know. Maybe you know because I haven't looked at this folder for a long time.
MR. VEZEAU: Are you aware of this? It's -- one of the documents Dr. Smith produced is a January 5, 1989, confidential disclosure agreement with Genex.
MR. HARTH: Is that in the pile?
MR. VEZEAU: Yeah.
(SMITH DEPOSITION EXHIBIT NO. 17 WAS MARKED FOR IDENTIFICATION BY THE REPORTER.)

BY MR. HARTH:
Q. I'm going to hand you what we've marked as Smith Exhibit 17. I'd ask you to take a look at that and tell me whether that refreshes your recollection as to the existence of a confidentiality agreement?
A. I believe there -- it's very plausible that there -- it's obviously plausible there was a confidentiality agreement, and this would seem to indicate there is. It doesn't contradict my memory.
Q. All right. And is this your signature on --
A. Yes.
Q. -- on the second page?
A. It is.
Q. Did Genex prepare this agreement?

A. Yes.
Q. Did you have any written materials that you used during your meetings at Genex, do you recall?
A. I don't remember.
Q. Did you designate any of the information that you communicated during your visit to Genex as being confidential information under the terms of this agreement?
A. No, I didn't. Not that I can recall.
Q. In the foreword that you wrote to "Phage Display of Peptides and Proteins," you talk about the closing of the eventful year of 1988 and on December 15 of 1988, sitting in Jim Larrick's's office at Genelabs, Inc. Do you have a recollection of meeting with Dr. Larrick?
A. Yes.
Q. Where is Genelabs, Inc.?
A. It's in the Bay Area. I can't remember what the town is, but it's in the Bay Area.
Q. During the course of your meeting with Dr. Larrick, did you discuss phage antibodies with him?
A. I don't believe so, no.
Q. What were you discussing?
A. Drugs. His idea, which I really had not focused on before, was that peptide antibodies could be used as a way of finding leads for drugs; peptides that bind receptors would be potential leads to new classes of drugs. That was

the basic tenor of that.
Q. All right. On both the November 1988 grant application, which I'll ask you to dig out, and the application for continuation grant, there is a box on the form which appears at the front page. Item 11, "Inventions (see instructions)," no and yes?
A. Uh-huh.
Q. Do you see that?
A. Yes.
Q. Is it a fact that you checked the "no" box with respect to --
A. Yes.
Q. -- your November 1988 grant?
A. Yes.
Q. And you also checked the "no" box with respect to your application for the continuation grant on Exhibit 8?
A. Yes.
Q. What was the significance of checking that box, to you?
A. The significance was that we did not feel we had anything -- we had developed something that we wanted to consider as an invention.
(SMITH DEPOSITION EXHIBIT NO. 18 WAS MARKED FOR IDENTIFICATION BY THE REPORTER.)

BY MR. HARTH:
Q. I've handed you what we've marked as Smith Deposition Exhibit 18. Can you identify this document?
A. It's a cover letter that we sent with preprints of the paper by Jamie Scott and me that was to be -- was going to be published in "Science" in 1990.
And the purpose of the letter was to spell out what our policy was going to be about distributing libraries and vectors and things like that because we knew there was going to be an increase in interest in obtaining these materials.
Q. How did you know that?
A. How did we know?
Q. Yeah.
A. Well, we guessed.
Q. Okay. Were you right?
A. Yes.
Q. Do you still have a copy of the pre-print, by any chance, back in your office?
A. It's possible. I don't know.
Q. I will put that in the letter and ask that you check on that.
Now, the libraries that you were distributing were the epitope libraries, correct?
A. Okay. Well, what we've -- what we say in item 2

is that "We will make our strains and general protocols... available." And --
Q. I'm talking about No. 3, "a limited amount of" --
A. Yes.
Q. -- "library"?
A. Yeah. Okay. So in item 3 we say that we will distribute a small amount of the library to some people. But we're making the point that we're not making that generally available because we only had a limited supply at the time.
Q. You're talking about the epitope library, correct?
A. That would be the epitope library that Jamie Scott constructed in my lab, yes.
MR. VEZEAU: Is this one exhibit? two exhibits? or what?
MR. HARTH: Two exhibits.
MR. VEZEAU: Do you know which ones?
MR. HARTH: Yes, I do.
MR. VEZEAU: Okay.
MR. HARTH: You will soon.
(SMITH DEPOSITION EXHIBITS NOS. 19 AND 20 WERE MARKED FOR IDENTIFICATION BY THE REPORTER.)

BY MR. HARTH:
Q. I'm showing you Exhibit 19.

MR. VEZEAU: Before you do that, these documents are designated highly confidential under the protective order.
MR. HARTH: Well, I think if you listen to the testimony that's forthcoming, you'll realize that it meets one of the exceptions in the protective order.
MR. VEZEAU: What's the exception?
MR. HARTH: This is his document.
MR. VEZEAU: Okay.
Which ones -- which one is -- let me see these so I can conform these.
MR. HARTH: That's 19. That's 19.
MR. VEZEAU: The two-page?
MR. HARTH: Uh-huh.
BY MR. HARTH:
Q. Can you identify what I've just handed you as Exhibit 19?
A. Well, it would be one of our manuals, what we call the manual, which is a set of protocols for how to use filamentous phage display vectors, the fUSE vectors. I think we called it the fUSE vector or - yeah, cloning and fUSE vectors.
I don't know if this is the same version, if Exhibit 19 is the same version as Exhibit 20.
Q. Was there a version that existed at the time of

your March 27, 1990, "Dear Colleague" letter?
A. Yes. Yeah, there was.
Q. And Exhibit 20 has a date subsequent to that?
A. Yes.
Q. I don't think you've identified Exhibit 20 yet. What is Exhibit 20?
A. Okay. Exhibit 20 is the first page of an updated version of what we called the manual. And this would have been a couple years after that 1990 letter cover letter that was Exhibit 18.
Q. All right.
A. And I think that Exhibit 18 would refer to a version of the manual that was between -- that was -- that preceded this February 10, 1992, version that is Exhibit 20.
Q. Is that the version that's reflected in Exhibit 19?
A. I don't know. I don't think so, though.
Q. Was there another version somewhere?
A. I don't know which one -- which version Exhibit 19 is. Exhibit 20 is -- it's actually the latest version that we made before we put our protocols on the internet.
Q. All right. But there were earlier versions?
A. Yes. There were -- before the version, the February 10, 1992, version, which is exhibit -- the first page of which is Exhibit 20, I think there was a version

around 1990, the middle of 1990.
Q. All right.
A. But I would have to go back to our records to find that.
Q. And then was there an even earlier version that existed at the time you wrote the March 27, 1990, letter?
A. Yes. There was a version in 1989.
Q. All right. So there is a 1989 version, a mid-1990 version --
A. I believe so, yes.
Q. -- and then the February '92 version?
A. Yes.
Q. And after that it went on the web?
A. We lived with this one for many years and...
Q. Do you, do you have still copies of the three versions of the manual?
A. I know I have the 1989 version and I have the 1992 version; and I don't know about the 1990 version, assuming there is one.
Q. All right. I will ask you to provide us with all versions that you're able to get your hands on.
Did you discuss phage antibodies at any other conferences or sympozia prior to, say, the end of 1990? And when I say "other," other than the Banbury Conference in April of '89 and the departmental seminar in '89?

A. So the Banbury Conference was April of 1990.
Q. '90, I'm sorry.
A. I don't remember specifically.
Q. Generally?
MR. VEZEAU: I object --
A. I don't remember generally.
MR. VEZEAU: I object to that. I don't know what that means.
BY MR. HARTH:
Q. Do you remember discussing phage antibodies with any other scientists, perhaps not as part of a formal presentation, but informally?
A. Yes, I remember -- you're going to be asking about the same period, before the end of 1990?
Q. Yes.
A. Oh, I can't remember specifically. I just don't know.
Q. When you say you don't know, are you recalling something you don't know when the date was?
A. Yes.
Q. What do you recall?
A. I know I had at least a couple of phone conversations about phage antibodies.
Q. With whom?
A. I don't know. I can't tell you specifically.

Q. Do you know the affiliations of the persons that you talked to?
A. I can't be sure, no.
Q. Do you know if you ever talked with anyone from Cambridge Antibody Technology about phage antibodies?
A. Well, I mean, ultimately, of course.
Q. During --
A. But during that period --
Q. Yeah.
A. -- I can't say. I don't know.
Q. Did you ever directly supply fd Tet to anyone other than Dr. Dower?
A. Yes, to many people. Oh, fd Tet?
Q. Yeah.
A. Oh, yeah, well, to many people.
Q. Okay. Now, at some point was that deposited with the American Type Cell Collection?
A. American Type Culture Collection.
Q. Culture Collection.
A. Yes, it was.
Q. Did you receive any notification from the ATCC when another scientist would request a sample from what you had deposited?
A. I don't remember.
Q. Do you recall ever having provided yourself or

your lab fd Tet to any of the scientists with Cambridge Antibody Technology or the Winter Lab?
A. I don't recall specifically.
Q. I'm going to show you what was marked as Exhibit 20 from the deposition of Dr. Brian Kay. Why don't you just take a minute and take a look at that.
A. Okay.
Q. Do you recognize the second page of this exhibit?
A. This is -- I can't remember exactly where this -- this is a foreword to another book, right? It's -- but I -- can you refresh my memory?
MR. VEZEAU: Well, the -- you ought to answer his question first and then he'll work on that. The question was, do you remember?
BY MR. HARTH:
Q. Take a second to look at it.
A. Well, it's a foreword to a book. And I -- I'm afraid I can't remember which one it is.
Q. All right. And I think I can refresh --
A. It's the same one?
Q. Right.
A. All right. Okay. All right. Certainly the same language. Okay.
Q. There is a sentence about a quarter of the way down the page. It starts, "The new idea..." Do you see

that?
A. Uh-huh.
Q. "The new idea, which I dubbed 'infectious antibodies' (now called phage antibodies), became a key aspect of the new grant proposal I submitted to the NIH on November 1, 1988."
A. Uh-huh.
Q. I will represent to you that that sentence did not make it into the published foreword.
A. Uh-huh.
Q. And my question to you is, do you recall having conversations with anyone with respect to editing out this sentence?
A. I don't. I don't recall. I might have, but I don't recall.
Q. Do you recall any recollection of discussing your foreword with Dr. Kay?
A. I don't.
Q. Did you receive a copy of the book after it was published?
A. Yes. Yes, I did.
Q. Did you realize that a sentence had been edited out of the foreword?
A. No, I didn't realize.
Q. Have you ever known about that until the last

couple of days?
A. I didn't remember anything about it, no.
Q. Were you even aware of it before yesterday?
A. I may well have been, but I don't remember now.
Q. Okay.
(SMITH DEPOSITION EXHIBIT NO. 21 WAS MARKED FOR IDENTIFICATION BY THE REPORTER.)

Q. Dr. Smith, you had testified earlier that you had sent --
MR. VEZEAU: What is this you placed in front of the witness? Excuse me.
BY MR. HARTH:
Q. -- that you had sent out your laboratory notebooks concerning the first display of the anti-fluorescein fragment on phage?
A. Uh-huh.
Q. You have to say yes or no. I'm sorry.
A. Yes. Yes. I'm sorry.
Q. Who did you send those notebooks to?
A. I sent them to Jorge Goldstein, who was in this firm of Sterne Kessler Goldstein & Fox. And they were representing at the time Enzon, who were trying to -- trying to support what the patent that originally Genex had filed for displaying domains, including single-chain antibodies,

on living things.
Q. What happened to those notebooks?
A. They were lost in the mail.
Q. How do you know that?
A. Well, of course, when they didn't appear at the firm, we called up Mr. Goldstein and asked about them. And he said he never received them and he would go to their mailroom -- apparently, they have a systematic -- a system for checking in mail -- to find if anything had been checked in. And nothing had.
So we filled out this complaint to the post office. But nothing has been -- they never succeeded in finding anything.
I believe we also pursued this on the phone with the post office, talking with people.
Q. I've handed you what with we've marked as Smith Exhibit 21, which is a copy of a document from your files. What is this exhibit?
A. This is a complaint form from the post office, and this was filled out by Robert Davis, my tech. He's also the person that wrote the -- that packed the materials and sent them in the first place.
Q. All right. And this form reports a loss in the mail, is that the idea?
MR. VEZEAU: Objection, lack of foundation

and leading.
BY MR. HARTH:
Q. You can answer.
A. Yes, it reports a loss in the mail.
Q. The form indicates that the article was mailed March 29, 1996. Do you see that?
A. Yes.
Q. Is that accurate to your knowledge?
A. It would -- yes.
Q. Have you ever located those notebooks since they were mailed?
A. No, we have not.
Q. Have you ever received notification from the United States Department of Health and Human Services that copies of your November '88 grant application had been requested by third parties under the Freedom of Information Act?
A. Yes, I have received such -- I have received such notifications.
(SMITH DEPOSITION EXHIBIT NO. 22 WAS MARKED FOR IDENTIFICATION BY THE REPORTER)

BY MR. HARTH:
Q. I'm showing you what we've marked as Exhibit 22. Can you identify that document?

MR. VEZEAU: Well, that question lacks a proper foundation.
BY MR. HARTH:
Q. Have you ever seen this document before?
A. I can't remember it. I think I have, but --
Q. All right. Do you see at the --
A. I filed it probably.
Q. Do you see at the end of the third paragraph the sentence, "A copy of this letter has also been sent to George Smith"?
A. Uh-huh.
MR. VEZEAU: Dr. Smith, you'll note there is a number at the bottom. That's document produced by MorphoSys. That is not from your files.
THE WITNESS: Oh, it isn't? Okay.
BY MR. HARTH:
Q. No, it is not and I don't mean to suggest that it is.
A. Okay. Well, all right, so can I just amend that to say that I don't specifically know that I've seen this particular request.
Q. Have you seen similar requests?
A. Yes.
Q. Do you know how many such requests, approximately, you've been notified of over the years?

A. No.
Q. Less than ten?
A. Probably less than ten.
Q. All right. And do you know when the first such request was made?
A. No.
Q. Do you know if any requests were made prior to February 24, 1994?
A. I can't say.
Q. All right. Did you ever reply to any of these requests?
A. No.
Q. Did you ever --
A. Oh, sorry. I'm not sure of that. I never replied that I wanted to remove any materials. But I might have replied to the effect that it's okay to release the whole thing.
Q. That was going to be my next question. Did you ever, in response to any of these requests, ask that any portion of your grant application be redacted?
A. No.
Q. If you had received a request or a notification from Health and Social Services similar to Exhibit 21 back, say, in March of 1990, would you at that time have requested that any part of it be redacted?

MR. VEZEAU: Objection, calls for speculation, lack of foundation.
BY MR. HARTH:
A. No, I wouldn't have.
Q. Why not?
A. It just wasn't my policy. I was also talking freely about the technology, so I wouldn't have seen any point to.
MR. HARTH: Why don't we take a short break. I think I'm just about, if not, done with my questioning. But I want to consult with my colleague.
(Recess.)

MR. HARMON: Back on record.
MR. HARTH: Dr. Smith, I have no further questions for you at this time.
Mr. Vezeau, I'd ask that you leave me about 20 minutes for any redirect.
MR. VEZEAU: I'll see how we go with that. I just can't make any promises right now, David.

EXAMINATION BY MR. VERZEAU:
Q. Dr. Smith, would you want to take a short break and take a walk or what's your preference? You tell me.
A. My preference is we go on.

Q. Okay. So that's exactly what we'll do then. I do have some questions.
First of all, when was the first time you met either Mr. Harth or Mr. Booth?
A. Mr. Booth, I met in probably November of 1999. It's around that time.
Q. Did he represent you as an attorney?
A. Mr. Booth represent me as an attorney?
Q. Yes. Did he?
A. No, no.
Q. Okay. What was the occasion of you meeting him?
A. It was this lawsuit and -- I think -- I think the idea was that I would be a witness for the -- an expert witness. I'm not sure actually the exact, what the exact subject was.
Q. An expert witness for MorphoSys?
A. Yeah. I hope I've got this right.
Q. How many times in 1999 did you meet with Mr. Booth?
A. Once.
Q. Once?
A. I believe so.
Q. Okay. Did you meet with anyone else from MorphoSys in 1999 or earlier concerning the McCafferty patent or the Griffiths patent, either U.S. or European

versions?
A. I can't recall specifically, so I don't know.
Q. Do you believe you did?
A. I don't want to speculate on whether I talked to them. I just don't know.
Q. Do you remember Dr. Virnekas?
A. I don't specifically remember talking with Dr. Virnekas.
Q. Do you recall receiving correspondence from Dr. Virnekas?
A. I don't recall. I really cannot recall specifically.
Q. Do you know who Dr. Virnekas is?
A. I -- he's one of the scientists at MorphoSys.
Q. And do you know he's in charge of their intellectual property at MorphoSys?
A. I believe I know that now. Whether I knew it then, I don't know.
Q. Have you ever met Dr. Virnekas?
A. I might have, but I don't know.
Q. Okay. Have you corresponded with Dr. Virnekas either in paper form or electronic form?
A. I might have, but I have no records of that and I cannot say for sure.
Q. Do you believe you had e-mail correspondence with

anyone representing MorphoSys?
A. I don't -- I really can't recall specifically. I mean, I -- so I don't think I would -- I prefer not to answer a question about whether I believe or not.
MR. VEZEAU: I'll ask the reporter to mark for identification as Defendant's Deposition Exhibit 313 a document produced by MorphoSys in this litigation. What I will do is just mark it now; you can put a label over it. And Dr. Smith will hold onto it. That might expedite this. Is that all right?
THE REPORTER: That's fine.
MR. VEZEAU: Okay.
(DEFENDANT'S DEPOSITION EXHIBIT NO. 313 WAS MARKED FOR IDENTIFICATION BY MR. VEZEAU.)

BY MR. VEZEAU:
Q. All right. Dr. Smith, I'll hand you Defendant's Deposition Exhibit 313. This also bears a MorphoSys production number M11801. I'll ask you to please review that because I will have a question or two.
A. Okay. I -- okay.
Q. Have you read it?
A. Not -- no.
Q. Okay, maybe you should.
A. Okay.

Q. You've now read it?
A. Yes.
Q. Does that refresh your recollection at all about meeting Dr. Virnekas?
A. Yes. Evidently, I met him in that phage, so-called phage club meeting in Smolenice.
Q. All right. And Dr. Virnekas, in paragraph 2, says, "When I discussed the phage display patent issues you mentioned inter alia the NIH grant you had at that time, but you expressed your wish not to get involved in this patent dispute, and I definitely wanted to respect that."
Do you recall that discussion?
A. Vaguely, I recall that discussion.
Q. What do you recall?
A. Expressing exactly that point.
Q. Which was...?
A. That I was not going to be a witness for either side, an expert witness.
Q. Now, in the second-to-the-last paragraph starting "In the meantime..." --
A. Uh-huh.
Q. -- Dr. Virnekas mentions an attempt to get information from the NIH via the Freedom of Information Office, and he states -- this is Dr. Virnekas speaking -- "I was informed that, at least as far as I understood, the

Office would ask the Principal Investigator whether or to what extent he allows giving access. Therefore, unfortunately, it might happen that they will bother you."
Do you know if, indeed, you were contacted by the Freedom of Information Office, you or the University of Missouri, in connection with any request to have access to your grant proposal by MorphoSys?
A. I don't specifically recall. My usual response to those requests was simply to ignore them, which would mean that I did not withhold any materials.
MR. VEZEAU: I'll ask -- will you get another copy?
I'll ask the reporter to mark for identification as Defendant's Deposition Exhibit 314 another document from the files of MorphoSys bearing production numbers M81978 and 81979.
(DEFENDANT'S DEPOSITION EXHIBIT NO. 314 WAS MARKED FOR IDENTIFICATION BY MR. VEZEAU.)

BY MR. VEZEAU:
Q. I'll hand you Defendant's Deposition Exhibit 314 and ask you to please review that and let me know if you indeed received this document.
A. All right. This is nineteen -- the date of this letter is August of 1999?

Q. Yes.
A. You know, I don't know if I responded to this with, for example, that folder. I can't remember. Did you -- well.
Q. This came from the files of MorphoSys, not your files.
A. Right. I know. I'm just wondering if you found something in my files that responded --
Q. No, I didn't.
A. -- to this one?
Q. And that's why I'm asking you.
A. I don't remember responding to this.
Q. Had you informed Dr. Virnekas that, at least to your way of understanding, the discussions at the Banbury Conference were confidential?
MR. HARTH: Objection, leading.
MR. VEZEAU: Of course. This is cross.
MR. HARTH: He's not an adverse witness, he's not a hostile witness.
MR. VEZEAU: This is -- all right, you stated your objection, Mr. Harth. Let's --
THE WITNESS: So your question is...?
MR. VEZEAU: Do you want to hear it again?
THE WITNESS: Could you read that question?
(The reporter read the last question as

follows:
"QUESTION: Had you informed Dr. Virnekas that, at least to your way of understanding, the discussions at the Banbury Conference were confidential?")
BY MR. VEZEAU:
A. I don't remember saying that specifically to Dr. Virnekas. I do remember saying that on several occasions, but I don't remember specifically saying it to Dr. Virnekas.
Q. And what was the basis for your belief that the discussions were confidential?
A. The materials that Banbury sends out to the participants have language to that effect. I don't know if I have a copy of that -- of those guidelines. I know it's not in this folder, but it could be in another Banbury Conference folder of one of the other Banbury Conferences that I've attended.
But it seemed -- I recall being impressed on the participants that these were confidential and that all, any material, anything cited from it would have to be cited as personal communication, not as a publication or as a talk or anything like that, as a formal talk.
Q. Now, on page 2 of Defendant's Deposition Exhibit 314, you'll note in the first full paragraph, starting "Of course," that Dr. Virnekas identifies himself as the internal MorphoSys patent attorney. Do you see that?

A. Uh-huh.
Q. And that he was responsible and interested in identifying prior art which could help his company to attack some patents or patent applications in the field. Do you see that?
A. Uh-huh. Uh-huh. Yes.
Q. Did he ask you or did anyone else from MorphoSys ask you to assist in connection with the litigation against Cambridge Antibody Technology?
MR. HARTH: I'm going to object to that question as being leading.
May I have a standing objection to leading questions in light of your position?
MR. VEZEAU: As far as I'm concerned, you can. I don't think it's proper, but you do what you want.
Would you please read the question back?
THE WITNESS: I'm sorry, read the question again.
(The reporter read the last question as follows:
"QUESTION: Did he ask you or did anyone else from Mor-foe-fus -- Mor --
THE WITNESS: MorphoSys.
THE REPORTER: -- "MorphoSys or Cambridge, Cambridge Antibody Technology in connection with the

litigation" -- no. Let me start over.
MR. VEZEAU: Please.
THE REPORTER: I'm sorry.
MR. VEZEAU: No, that's okay.
THE REPORTER: "Did he ask you or did anyone else from MorphoSys ask you to assist in connection with the litigation against Cambridge Antibody Technology?")
BY MR. HARTH:
A. I have -- I believe so. I believe I was asked to help their side.
Q. And you were indeed sent materials by attorneys representing MorphoSys; is that correct?
A. I'm going to have to say I don't recall but maybe my files will tell -- give the answer to that question.
Q. Do you recall receiving materials from Mr. Booth in 1999?
A. Yes, I do.
Q. And what do you recall receiving?
A. I received copies of patents, patent applications. That would be 103 -- 108 and 793, I think. These are two patent applications that are at issue here. And I guess asked for comments. And we had a few exchanges by e-mail, short exchanges.
Q. You were asked to make -- for comments, your comments?

A. I was asked to make comments, yes.
Q. Had you previously agreed to provide comments?
A. Before that? I don't remember. I don't remember whether I -- whether I agreed -- I don't -- actually, I can't remember specifically whether I agreed in advance to provide comments on them.
Q. Do you believe you just received a letter out of the blue from --
A. No, no --
Q. -- Mr. Booth?
A. -- no, no, no, no.
Q. Okay. What I'm trying to find out is what occasioned his, if you know, his sending you these documents to review, these patents?
A. We had some -- we had some kind of communication. I don't remember if it was e-mail, letter, phone. Some kind of communication. And in the con -- and the net effect -- the net result of that was that they sent these documents to me so I could look at them. That's my recollection.
Q. And you agreed to review these?
A. To look at them, yes.
Q. Why? I thought you had previously said you didn't want to get involved?
A. Well, I guess you could say that I was reconsidering.

Q. Okay.
A. If -- I'm not sure the responses that I made to requests to help that side, so I'm very fuzzy on any kind of chronology here.
Q. Now, when -- your responses were provided in what manner, by e-mail?
MR. HARTH: Objection, lack of foundation.
BY MR. VEZEAU:
A. I think I made some responses by e-mail. And I might have sent things, I just don't know, actually sent a paper. But I don't know. Actually, I cannot remember. And I might have made responses during the meeting, the actual meeting, with Mr. Booth in 1999.
Q. Did you bill for your time?
A. No.
Q. What became of the e-mail? Did you retain copies of the e-mail responses?
A. I think I have those e-mails, yes.
Q. Now, we didn't see those in the folders that you produced --
A. No, I should have -
Q. -- and we previously asked for that.
A. Yes, yes. I'm afraid that was an oversight. But I could produce those.
Q. Okay. Do you have --

A. Whatever is in my computer.
Q. Do you have a file for -- that contains these letters?
A. No. It would -- no.
Q. Okay. How would you go about finding this correspondence?
A. Just what's on the e-mail -- the e-mail folder in my computer.
Q. Yes. And that's what I meant by a file. I meant an --
A. Oh.
Q. -- electronic file.
A. Yes.
Q. Excuse me.
A. I'm sorry. Yes.
Q. The correct term is folder.
A. Yes.
Q. You're absolutely right.
A. No, no --
Q. You're right.
A. Wait --
Q. What do you call that --
A. I do have --
Q. Yeah. What do you call that folder?
A. Yes.

Q. What is -- did you give that folder a name?
A. Well, that folder is called "trash" in my e-mail program. But it's a folder of materials that are seen. And if you ask it to go to trash, it's saved, but it's out of the in and out boxes, in and out folders.
Q. All right. We are going to ask you for copies of all correspondence. And we previously asked you for that. And I think you've produced some written correspondence, which we'll get to. But certainly we also requested e-mail correspondence. So we will ask you to please retrieve that.
A. Okay.
Q. Whether it was you sending copies to MorphoSys or its representatives or their sending copies -- e-mails to you.
A. All right.
Q. Do you understand that request?
A. Yes.
Q. Thank you.
We'll make the same request, of course, of MorphoSys, which I thought we already did.
Where did you meet with Mr. Booth in 1999?
A. We met here in Columbia at a coffee shop, a cafe, and then at a restaurant.
Q. How long was your meeting?
A. Well, I won't be able to be exact about it, but

probably of the order of three hours.
Q. And during the course of that meeting, did you review documents?
A. At least short documents, I think. But I'm afraid I'm a little fuzzy on what -- I'm fuzzy on exactly what we looked over during that meeting.
Q. Who was present at that meeting?
A. Mr. Booth and another attorney from his firm, and I can't remember his name. He'll refresh my memory. Not one of the -- not anyone that's here.
Q. Do you recall the topics that were discussed during that meeting?
A. Well, the general topic was the challenge to the CAT patents. I think most of the conversation concerned the McCafferty patent, which I guess is the 108, the one numbered 108.
And I think the idea -- I hope I'm right about this, but my recollection is that the idea was -- the question was whether I would help that side; which I said -- as, you know, as their witness. And I said no.
Q. Did you also --
A. I ultimately said no.
Q. Did you also discuss the Griffiths patent, 793?
A. 793. We -- I'm -- I think we did, but I'm not sure actually.

Q. Was that at the same meeting or a different meeting?
A. We only had one.
Q. Did you meet Mr. Harth before this week?
A. I don't think so.
Q. Have you corresponded with Mr. Harth or has he corresponded with you?
A. Not that I can recall.
(Mr. Vezeau and Ms. Choi conferring out of the hearing of the reporter.)
MR. VEZEAU: Let's check and see -- maybe we can go off the record for a second. Jane --
(Off the record.)

MR. VEZEAU: Let's go back on.
MR. HARMON: Back on record.
MR. VEZEAU: I'll ask the reporter to mark for identification as Defendant's Deposition Exhibit 315 a document -- documents produced from your files yesterday, Dr. Smith.
(DEFENDANT'S DEPOSITION EXHIBIT NO. 315 WAS MARKED FOR IDENTIFICATION BY MR. VEZEAU.)

BY MR. VEZEAU:
Q. I'll hand Defendant's Deposition Exhibit 315 to

you and ask you to please review it and tell me if you know what it is.
A. Well, it's -- I might have seen this before, but I'm going to have a hard time saying if I specifically recollect what this document is.
Q. Do you believe you received this document? It came from your files.
A. It came from my files? Well, I believe I received this document, yes.
Q. Okay. And you believe you received it from Mr. Harth?
A. Well, it certainly looks like I got it from Mr. Harth.
Q. Okay.
A. I did not remember who I got the document from.
Q. Do you see a fax header on the document?
A. Yes.
Q. Do you believe you received it on or about the date of the fax header, which is November --
A. Yes --
Q. 24 --
A. -- that makes sense.
Q. -- 1999?
A. Yes.
Q. Okay. And do you understand that the document

attached to the fax transmittal sheet is an opposition by MorphoSys in the European patent office?
A. Yes, the European opposition. But, see, I'd have to -- the reason I'm hesitating about what it is, is I'm not even sure which patent it is that they are opposing here.
Q. Do you see --
A. I mean, I'd have to read through it to find -- to figure that out.
Q. I'll direct your attention to the third page of the Exhibit M16441.
A. Okay.
Q. And do you see the European patent identified at the top, entitled "Methods for producing functional, single-chain Fv antibody fragments on the surface of bacteriophage particles"?
A. Is that 441? Oh, I'm sorry. Yes, here it is. Yes. Right. Okay, shoot. Yes, I've got it.
Q. So does that ring a bell?
A. My -- yes. My guess is this is the McCafferty patent -- this is an opposition to the McCafferty patent.
Q. Do you know what occasioned this document being sent to you by Mr. Harth?"
A. I think that in preparation for our meeting, I believe that I requested some information about what the patent issues were.

Q. Had you spoken to Mr. Harth?
A. I do not recall speaking to Mr. Harth.
Q. Do you recall to whom you spoke?
A. It would have almost certainly have been Mr. Booth.
Q. All right.
I'll ask the reporter to marked for identification as Defendant's Deposition Exhibit 316 another document from your files that you produced yesterday.
(DEFENDANT'S DEPOSITION EXHIBIT NO. 316 WAS MARKED FOR IDENTIFICATION BY MR. VEZEAU.)

BY MR. VEZEAU:
Q. I'll hand that to you and ask you if you can tell me what that is?
A. Okay, so this is, Mr. Booth arranged for this patent to be sent to me. And I guess this patent was cited probably in the other document. So this is a patent from Dower, et al.
And it -- I think I glanced through this one, so I'm not -- I'm not very -- I'm not entirely sure of what is covered by the patent. But it's in general a display of proteins on filamentous phage.
Q. And starting partway -- in the back of the Dower patent, attached to the Dower patent is a copy of an

official action from the United States Patent and Trademark Office. Do you see that?
A. Okay. So would this be the very last page --
Q. No, no.
A. -- or the last few pages?
Q. The last few pages.
A. Okay.
Q. Let me see if I can find that for you.
A. Okay.
Q. The page I showed you is entitled "Examiner's Action" at the bottom.
A. Uh-huh.
Q. And it's that page and the following pages of the exhibit. Do you know why that document was sent to you?
A. I might have known at the time, but I can't recall now.
Q. And the time is, that you're referring to, either the date of this --
A. Well --
Q. -- transmittal or shortly thereafter?
A. The -- yes, that would be -- I might have realized at the time why that was included in the documentation. And the time would be November of 1999.
Q. Were you asked to review that official action, examiner's action?

A. I can't remember whether I was asked to review it or not.
Q. Okay. Dr. Smith, I'm asking this question on purpose, but I don't want to you take offense. Sometimes people's memories dim with time. I want to know if there's any condition you're aware of, any medical condition, that affects your memory?
A. No.
Q. Okay. Are you taking any medication that may affect your memory?
A. No.
Q. All right. Do you believe your memory was -- no, let me -- I'll withdraw that part.
Do you believe your meeting with Paul Booth was subsequent to November 24, 1999?
A. Yes, I believe it was.
Q. Okay. Do you know whether it was in 1999 or 2000 --
A. No --
Q. -- or 2001?
A. -- it was 1999. I'm pretty sure -- I think it was November 29 of '99. But it was the very, very end of 1999 -- of November, I mean.
Q. What occurred, if anything, subsequent to that meeting in connection with any assistance by you to

MorphoSys?
A. At some point, and it was probably after that meeting, I communicated that I'd declined to be, you know, a witness for MorphoSys's side.
Q. Did you do that in writing?
A. Not that I know of. It probably would have been by e-mail. And I probably could find that e-mail.
Q. Okay. Again, we'll ask you to --
A. Yes.
Q. -- search for all --
A. It was an oversight on my part --
Q. I understand.
A. -- not to find those e-mails.
Q. Now, subsequent to declining to serve as an expert witness, did you have any further conversations with MorphoSys or any representative of MorphoSys in connection with the McCafferty patent or the Griffiths patent?
A. The -- it -- there might have been something, you know, an e-mail or two, right around that time, you know, at the very end of 1999. But I don't recall any other communications until this deposition came up. So that would be just a month ago or so.
Q. When did you -- when and how did you learn that MorphoSys wished to take your deposition in this case?
A. Hmm, how did I learn? I believe I got a

communication from Mr. Booth.
Q. What --
A. And it was probably a phone conversation or an e-mail. I don't know. I can't remember which.
Q. If it's an e-mail, we'll all know soon, though, right?
A. Yes. Well, definitely we'll know by -- if it's e-mail.
Q. Okay. As best you can recall, what was the substance of that conversation or e-mail?
A. Just alerting me that a deposition would be taken.
Q. Okay.
A. And it would be in Columbia. And trying to find a schedule that would work both for their side and your side.
Q. Did you have any follow-up discussions or e-mail in connection with your deposition?
A. Apart from the request for a meeting alone yesterday, none that I can recall.
Q. None that you can recall, you're saying?
A. Yes. And I don't think there was anything except just the mechanics of setting up the deposition.
Q. Now, who made the request to meet with you alone?
A. I believe that was Mr. Booth.
Q. Do you know when that was made?
A. That would have been -- I can't say the specific

date, but it was not -- it was very recently.
Q. Did Mr. Booth explain to you why he wished to meet with you alone?
A. No.
Q. Now, you're aware that we, on behalf of CAT, requested to be present at any meeting --
A. Yes.
Q. -- with MorphoSys representatives?
A. Yes.
Q. And what was your response to that request?
A. My response was I would ask MorphoSys --
Q. And --
A. -- and they wanted a meeting by themselves. And my response to that was, okay, but I was going to -- I would extend to you the same opportunity, extend to your side, the Cambridge Antibody Technology side, the same opportunity.
Q. And you did meet yesterday with Mr. Booth and Mr. Harth?
A. Yes.
Q. For how long?
A. A little bit less than two hours.
Q. Okay. And that was in your offices?
A. No, it was in a conference room --
Q. Oh, that's right.
A. -- in our building.

Q. Were you shown any documents during the course of that meeting?
A. Was I shown any documents? Mostly I was -- I showed them documents. I brought the documents that you saw.
Q. That were produced?
A. That I was producing in response to the subpoena. And did I -- did they produce any documents to me? I actually can't remember any, seeing any documents that they produced for me. Oh, yes -- no, hold it. Yes, they did. I do remember. They did produce the -- that introduction to the --
Q. The draft foreword --
A. Yeah.
Q. -- to the book co-edited by Dr. Kay --
A. Well --
Q. -- Dr. Winter and --
A. Well, no, I'm not sure that I saw any of the edited --
Q. Okay.
A. -- business. But that book was brought up and the introduction --
Q. I see.
A. -- to it.
Q. Okay. And that was the topic of your --

A. I'm actually getting confused between the two sides.
Q. Okay.
A. Because I know that your side did bring that up. And I actually can't remember in what ways they brought it up.
Q. Okay. But that, you believe, was a topic of your discussion --
A. Yes --
Q. -- yesterday?
A. -- it was among the topics, yes.
Q. Okay. As best you can recall, what other topics were discussed?
A. The topics had to do with -- the main thrust of it had to do with whether the invention of single-chain antibodies displayed on phage -- phage -- phage antibodies was publicly disclosed as a result of the grant proposal that I submitted and as a result of publicly talking about the grant proposal.
Q. Now, you indeed attempted to get patent protection that would cover the display of single-chain antibodies on a living --
A. Yes.
Q. -- organism --
A. I agreed --

Q. -- is that correct?
A. I agreed to be a co-inventor on that patent application, yes.
Q. And that was with Ladner; is that correct?
A. Well, was with the company -- it was ultimately with Enzon, which was the company that took over the patents from Genex Corporation, who filed the original patent application.
And the first inventor on that application was Ladner. But at the time when I ever had any contact with Genex, Ladner had left the company. So I never had talked about this with Ladner himself, even though I know him, about that -- about this patent.
Q. Why were you interested, if you were interested, in being a co-inventor?
A. Well, I'm not quite sure about my -- about why I did it. But certainly I had cooperated with them at the beginning trying to set up this collaboration where my lab would be doing phage display of single chain antibodies. And when they brought up the idea of my coming in to help their patent, I agreed to it. And I guess, are you asking what my motivation is or what I thought was in it for us?
Q. Yes.
A. I certainly thought this potentially could be a viable patent that would make money for the university and

for my laboratory. So I thought there was a chance that this would be -- I'm putting my mind back in those days, but I thought there was a chance that this could be something valuable.
Q. When did you get involved with Jorge Goldstein? When did you start your involvement?
A. That was probably in 1991, maybe late in 1991. I'm actually not sure. I'd have to look at the chronology of when the -- when Enzon acquired the patent from Genex and when the this company, Stern, et al., came to represent Enzon in that matter. But I think it was 1991. Maybe late 1991.
Q. And in connection with that effort, do you recall preparing a declaration that was submitted to the United States Patent and Trademark Office?
A. I believe that I helped to prepare one. Basically, sort of edited their version. I'm actually not sure of this. It's a long time ago and I'm having a hard time recalling the specific events, but I think that's what I did.
MR. HARMON: I need to change tapes.
MR. VEZEAU: Sure. Go ahead.
(Off the record.)

MR. VEZEAU: Shall we go back on?

MR. HARMON: This is tape 3. Back on record.
BY MR. VEZEAU:
Q. I had directed your attention to exhibits -- Defendant's Deposition Exhibits 315 and 316, which was correspondence paper or facsimile correspondence with MorphoSys counsel. Do you know if you had any other correspondence with MorphoSys counsel?
A. Well, we've already mentioned --
Q. Dr. Virnekas?
A. -- with Mr. Booth and we've already mentioned Dr. Virnekas. I can't recall, but I might have. I don't know. Not that I know -- not that I can remember now.
(DEFENDANT'S DEPOSITION EXHIBIT NO. 317 WAS MARKED FOR IDENTIFICATION BY MR. VERZEAU.)

BY MR. VERZEAU:
Q. Okay. I'll place before you Defendant's Deposition Exhibit 317 and ask you to please take a look at that.
A. Okay. Okay. All right.
Q. You tell me when you're -- I have some questions about this document --
A. Okay.
Q. -- so you tell me --
A. Could I just --

Q. Yeah, you might want to take a look at it and read it.
A. Can you tell me -- let's see.
Q. This document, by the way, Dr. Smith, is from your file.
A. Right. Okay, I --
Q. Have you read it?
A. Yes.
Q. Now I'd like to direct your attention to the last page of Defendant's Deposition Exhibit 317. Is that your signature?
A. Yes.
Q. And the date that appears there, June 30, 1995, is that the date you believe you signed this document?
A. Yes.
Q. Okay. Now, you stated right above it that "I further state that all statements made on our own knowledge are true and that all statements made on information and belief are believed to be true and further that willful false statements and the like are punishable by fine or imprisonment or both under Section 1001 of Title 18 of the U.S. Code and may jeopardize the validity of the application or any patent issuing thereon."
Did you understand that when you signed this document?

A. Yes, I think I did.
Q. And did you believe the statements you made in this declaration by you were true?
A. Yes.
Q. Is it a fact that you would not have made these statements if you did not believe they were true?
MR. HARTH: Objection, leading.
BY MR. VEZEAU:
A. Yes, I think it's true that I would not have made the statements if I didn't think they were true.
Q. Now, you also identified -- let's go to page 1 of this document, please, this declaration by you. This was submitted, do I understand correctly, in the Ladner, et al., application that you were working on with the Enzon lawyers?
MR. HARTH: Objection, leading.
BY MR. VEZEAU:
A. I don't recall the context in which I made this declaration.
Q. All right. I'll ask you to look at the heading --
A. Okay.
Q. -- in the upper left-hand portion. Do you see Ladner, et al. --
A. Yes.
Q. -- application so-and-so? Does that help?
A. Well -- okay, the reason I'm hesitating is I'm not

sure which Ladner, et al., application this is.
Q. Okay.
A. Is this the February 1987 application for the -- on displaying single-chain antibodies and other molecules on the surface of living organisms?
Q. I just got this document from your files.
A. Yeah.
Q. I hope you understand that.
A. Yes. Okay, so I'm -- the reason I'm hesitating is I'm not exactly sure which Ladner, et al., this is, but I believe it was probably to do with that Ladner, the Ladner patent, but I'm not -- I'm just not sure.
What does "filed" mean here? What does that filing date mean?
Q. That's the filing date of the application number set forth above. But --
A. It may not --
Q. -- it may be a continuation --
A. Yes.
Q. -- application.
A. All right. So this is -- this is plausibly that original Ladner application on phage -- on displaying single-chain antibodies and other binding molecules on the surface of living things.
Q. All right.

A. So the title here is changed from his original title.
Q. Okay.
A. So I'm guessing that that's correct, yes. Okay.
Q. Regardless, the statements you believed were true when you made them; is that correct?
A. Yes.
Q. All right. Now, in the paragraph 2 of this declaration, Defendant's Deposition Exhibit 317, you identify the Smith 1985 publication and the Parmley and Smith 1988 publications that you discussed during your questioning with Mr. Harth today. Do you see that?
A. Yes.
Q. All right. Now, do you see in paragraph 4 on the next page of this exhibit where it was your opinion that the 'Parmley and Smith' and 'Smith' publications in combination with the HUES-tun -- HUS-tun patent --
A. It's HUES-tun.
Q. Huston. -- "would neither have taught nor suggested the claimed invention to one of skill in the art" for the reasons you subsequently set forth?
A. Yes.
Q. Now, at the end of -- I'll withdraw that partial question.
In paragraph 8 you state: "However, the

additional conformational constraint posed onto a molecule such as an SCA that is expressed on the surface of an organism may have been expected to interfere with its ability to fold properly and thus, with its ability to retain binding functionality. The SCAs of the present invention are subject to such an additional conformational constraint not only because they are larger molecules than the antigens in the prior art, but also because they are on the surface of a phage, and not in solution."
Do you see that?
A. Yes.
Q. What did you mean by "conformational constraint"?
A. The expressing a protein on the surface, on the complex surface of an organism and this organism is being used to cover filament -- things like phages or viruses as well as cells that can grow autonomously like bacteria or mammalian cells. Anyway, it was saying that being -- lying on the surface, on the complex surface of an organism, would provide opportunities for interactions that might interfere with the ability of the protein to fold autonomously the way it would if it were completely free of associations with other molecules in solution.
Q. Now, the SCAs referred to in this paragraph 8 and elsewhere in this declaration, do I understand those are the single-chain antibodies you discussed in --

A. Yes, single-chain antibodies.
Q. Okay. Now, on paragraph 9, you refer to the SCAs of the present invention as consisting of "around 240 amino acids which are encoded with approximately 800 base pairs." Do you see that?
A. Uh-huh. Yes.
Q. And you -- you state that "In 'Parmley and Smith' and 'Smith,' we recognized" --
The we, do I assume it is you and/or you and Parmley?
A. Yes.
Q. -- "recognized that the length of a molecule or fragments thereof and the length of the gene encoding the molecule or fragments thereof is a factor that might obstruct its successful expression on the surface of a filamentous phage."
And then you go on -- you have a colon there and you go on to quote from both Smith and Parmley. Do you see that?
A. Yes.
Q. Did you at any time, in connection with your work on this application, identify your grant proposals submitted to the NIH?
MR. HARTH: I'm going to object to that question as being vague. Identified to whom?

MR. VEZEAU: To anyone.
MR. HARTH: Well, if that's the question, the witness should be advised that the question will encompass communications with your attorneys, and I would advise you to contact Mr. Hoskins before you would answer that question.
MR. VEZEAU: Are you being advised by MorphoSys counsel now?
MR. HARTH: He can take or leave the advice. But Mr. Hoskins, before he left, made his statement. You have -- clearly are asking him to communicate or testify to communications with his attorneys and in that he is not currently being represented here, I feel it's perfectly appropriate to warn the witness of what you're up to and to advise him to call his counsel. He can do it or not. It's up to him.
BY MR. VEZEAU:
Q. Are you going to answer the question or not?
THE WITNESS: Well, can you -- could you repeat the question, please?
THE REPORTER: (Nodding head.)
BY MR. VEZEAU:
Q. Before you do that, Dr. Smith, I'm not here to try to pry this type of -- if you're at all uncomfortable with the question and don't want to answer it, that's fine. I'm

not insisting. I'm just asking you if you will answer it. If you will not, that's fine. Because I don't want you to be uncomfortable here, in view of David Harth's comments.
THE WITNESS: Can you repeat the question?
(The reporter read the question as follows:
"QUESTION: Did you at any time, in connection with your work on this application, identify your grant proposals submitted to the NIH?")
THE WITNESS: Repeat it again. I'm sorry. I need to hear the first part of the question again.
(The reporter re-read the question.)
BY MR. VEZEAU:
A. So this is in connection with this grant propo -- this grant application?
Q. This is not a grant -- this is a patent application.
A. Sorry. Sorry. Patent application.
Q. Yes.
A. In connection with this patent application --
Q. Yes.
A. -- did I identify my -- the role of an NIH grant? I can't remember.
Q. Okay. That's fair.
In paragraph 11 of Exhibit 317 you state, "In

'Parmley and Smith' we recommended on page 315, left column, 'using fragments of 100 to 300'" --
Is that base pairs?
A. Yes.
Q. -- "as inserts, because we expected a construct larger (sic) than that to be unstable." Do you see that?
A. Yes.
Q. All right. "Additionally, we had observed an extensive breakdown of molecules encoded by more than 300 base pairs and a reduction in phage assembly and infectivity as a result thereof."
What was the extensive breakdown of molecules you refer to?
A. Well, it's possible to, and Steve Parmley did, in connection with that 1988 paper, examine the state of the gene III protein in the various phage displaying different domains.
And what he observed was that in the clone that was displaying the longest of the fragments that he studied, which was about -- a little bit more than a hundred amino acids, the gene III protein, the intact gene III protein was a very minor component. There was a component that consisted of the protein minus the foreign domain. And then there was also a strong component that was just about half of the gene III protein.

So that would be -- that would imply that this foreign domain that had caused the protein to be degraded, not just the foreign domain itself, but also the part of the protein that lies adjacent to the foreign domain. That was the observation. And that was what that's referring to.

And then it goes on to say that the phage were less infective and they were produced in less yield.

Q. You, also in paragraph 12, say, "Another obstacle to the success of the present invention was the possibility of the recombinant pIII-SCA molecule would be degraded during its transversion of the periplasmic space of the phage-producing cell."

What did you mean by the recombinant pIII-SCA molecule?

A. pIII or gene 3 protein, because they're synonyms, is the protein to which the foreign domain was fused and is constructs. The foreign domain in this case is the single-chain antibody.

So the pIII-SCA fusion, that protein is the -- this modified coat protein. And in filamentous phage assembly, that coat protein starts by being secreted through the membrane so that most of it lies in the periplasmic space.

And the periplasmic space was known to have potent proteases or protein degrading enzymes. So it was a strong

possibility -- it seemed a strong possibility at the time that the pIII single-chain antibody molecule would be subject to strong degradation forces.

Q. In paragraph 13 you state, "The conformational constraint posed on an SCA expressed not in solution but on the surface of a filamentous phage, the expected instability of an insert of the length of a SCA and the observed degradation of the products of such inserts, as well as the possibility of periplasmic degradation, rendered the success to express a functional SCA on the surface of a filamentous phage quite unpredictable at the time of filing. No reasonable expectation of success was available from my work on antigen fusions in 'Smith' and 'Parmley and Smith.'"

A. Okay. Could we say what the "time of filing," you know -- would you guess what -- would you be able to help me by helping me to interpret what "time of filing" means in that context --

Q. Dr. Smith --

A. -- would you know?

Q. -- no, I can't.

A. I know I'm supposed to know.

Q. -- these are your words.

A. I know, I know.

Q. In fact, I was going to ask you that precise question. Do you know what you meant in 1995 when you

signed this declaration and said it was true by at the time of filing?

MR. HARTH: Well, I'm going -- I'm going to interpose an objection here. Dr. Smith was kind enough to give both sides --

MR. VEZEAU: David, not a speech. Just an objection, please. That's --

MR. HARTH: Dr. Smith --

Please don't interrupt me.

MR. VEZEAU: This is speech.

MR. HARTH: You can make any comment you care to make after I'm done. But please don't interrupt me.

MR. VEZEAU: All right. I object to this type of speechmaking as intruding on the limited time we have for cross. I really do. Make your objection. You have no right to do anything more now.

MR. HARTH: Dr. Smith was kind enough to furnish both sides with copies of his files. It is apparent that he has not looked at these documents in some time.

He has asked you what I consider to be a reasonable question. You shot back, "Well, they're your words." But there are a number of other documents that he produced that would provide him with answers to his question. And I object to your proceeding without giving him a chance to look at those documents.

MR. VEZEAU: That's absolutely absurd. And this is a speech. This is an attempt to interfere with examination. And I'm going to ask the court for appropriate sanctions in view of this speech. That's not an objection. That's a speech. And you know -- you should know better, David.

MR. HARTH: In the meantime, I do not believe there is a question pending.

MR. VEZEAU: There was until you interrupted.

MR. HARTH: Mr. Vezeau, you just read, in a dramatic fashion, the paragraph. But there was not a question.

MR. VEZEAU: Then you didn't listen, sir, because I asked the witness if he recalled what he meant by "at the time of filing."

BY MR. VEZEAU:

A. So is that the question?

Q. Yes.

A. I do not recall now what "the time of filing" meant in that context.

Q. And you --

A. I'm afraid I don't.

Q. I understand. You also state in the same paragraph: "No reasonable expectation of success was available from my work on antigen fusions in 'Smith' and

'Parmley and Smith.'" Do you see that?
A. Yes.
Q. What was the basis for that statement?
A. The basis was what went before, which were the reservations that we expressed -- well, especially that Steve Parmley and I expressed in the 1988 paper about the possibility of expressing large domains on gene III protein.
So it was -- wasn't clear at the time that you would have success with a complex and relatively large domain like a single-chain antibody. That was the burden of that statement.
MR. VEZEAU: I'll ask the reporter to mark for identification as Defendant's Deposition Exhibit 318, a document entitled "Amendment and Response."
(DEFENDANT'S DEPOSITION EXHIBIT NO. 318 WAS MARKED FOR IDENTIFICATION BY MR. VEZEAU.)

BY MR. VEZEAU:
Q. Dr. Smith, I'll hand this to you and ask you to please take a look at it and tell me if you recognize that document. Again, this came from your files that you produced yesterday.
MR. HARTH: 318?
MR. VEZEAU: Yes.
BY MR. VEZEAU:

A. Okay, I see the document.
Q. Okay. Now, your declaration is referred to in this document at page 4, at the bottom, the last full paragraph or the last paragraph, "Applicants respectfully direct..." Do you see that?
A. Yes.
Q. Did you participate in the preparation of this amendment and response or did you comment upon this amendment and response?
A. I don't remember doing so.
Q. Okay. Do you know why this document was in your files, this exhibit -- this amendment and response, Defendant's Deposition Exhibit 318?
A. Well, I intended to file, though not terrifically systematically, the correspondence having to do with this matter in that -- well, it was in another folder, not the one that I gave you because ultimately I gathered all of them into one folder. I just filed it all into one folder.
But I put the correspondence into a folder, and it wasn't unusual for me to not even glance at it. So I may well never have read this, this response.
Q. Well, you were a co-inventor at that time of the application; is that right?
A. Yes.
Q. All right. And are you saying that you wouldn't

-- were not interested in this response?
MR. HARTH: Objection, leading, argumentative, misstates his testimony.
BY MR. VEZEAU:
Q. Do you know whether you reviewed this amendment and this response?
A. I don't recall --
Q. Okay.
A. -- so I can't tell -- answer your question.
Q. Did you work with Jorge Goldstein in connection with preparing this response?
A. To some extent, yes. As you saw, there were correspondence --
Q. Okay.
A. -- between us. But I would say that I did not work very hard on this patent matter.
Q. Let me ask you this. Do you recall objecting to any comment in this amendment or response?
A. I don't recall objecting, no.
Q. Okay.
MR. VEZEAU: Let's take just about a three- or four-minute break. It's a little warm in here. Catch your breath and we'll continue.
THE WITNESS: Okay.
(Recess.)

MR. HARMON: Back on record.
BY MR. VEZEAU:
Q. Dr. Smith, do you have any way of knowing whether in fact the notebooks you discussed that -- for which you filed a request to the post office to look, indeed, actually made it to Mr. Goldstein's office?
A. Sorry, could you ask the question again?
Q. Yeah, was that a little too convoluted?
A. Yeah, it was.
Q. I'll try again. Yeah. I was a little puzzled with the exhibit that was marked -- what was the last one? -- yeah, Exhibit, Smith Exhibit 21. Do you see that?
A. Uh-huh. Yeah.
Q. If you look at the top where the post office apparently checked, do you see that? It says, "We did not locate the article and the addressee failed to reply to our inquiry" -- et cetera.
A. Okay. Yes.
Q. Do you know if there was ever any follow-up?
A. Yes. I'm pretty sure we followed up on this pretty vigorously, actually, making phone calls. And this might have been the first response we got back. And we followed up and insisted that they try to get ahold of the addressee. And I either called him or he called us.

I actually talked to Mr. Goldstein himself at some point in the context of these missing lab books. And so he described how their mail system had worked and why he was convinced that it never got to their firm.
Q. Why did you send your lab books to that firm?
A. Upon their request.
Q. Now, you also discussed that there was a delay in concluding an agreement with Genex, between the University of Missouri and Genex. And part of the reasons were, I think you mentioned, patent concerns. Can you tell me what you meant by that?
A. I can't recall at this time exactly what the issues were. I just know that we had a hard time coming to an agreement. So I'd mentioned patents as just commercial protection. It's not that I remember specifically talking about patents. I really can't remember this far -- this long afterwards what we talked about; you know, what the issues were.
And I'm not -- I don't know if I have any correspondence on that issue. Maybe there is. I believe Mr. Hoskins would have found anything from the university's office that was run by Connie Armentrout at the time that would have to do with that. So I think he probably produced anything they had, but it's doubtful that there is anything.
Q. Do you know what, if any, restrictions were

imposed on you or the University of Missouri as a result of the collaboration with Genex in connection with the --
A. I can't remember --
Q. -- a single-chain antibody --
A. I certainly can't remember it now.
Q. Do you recall that there were restrictions?
A. I can't even recall that.
Q. Now, have you ever -- I'll withdraw that.
(Mr. Vezeau and Ms. Choi conferring out of the hearing of the reporter.)
Q. I'd like to direct your attention to what you called the pink sheets or the summary sheet that is marked as Smith Exhibit 8.
A. Okay.
Q. I'm sorry, Smith Exhibit 6.
A. It should be at the bottom of this pile; I don't quite -- remember setting it there. I'm sorry, I need to go through my -- here it is. It just got clipped together with another document. Okay.
Q. Thank you. This summary statement you received from the NIH; is that correct?
A. Yes.
Q. And do you know who prepared the critique at page 2?
A. Yes, I believe so. This is not someone that was

responsible for the criticism itself, but it would have been Gene Zimmerman, the executive secretary.
Q. Okay. And do you -- do you know --
A. So he's actually not allowed to have any part in the judgment or anything like that? He summarizing -- I'm very familiar with this process since I've been on study sections myself. The members of the study section submit their comments to the secretary, and the secretary creates the critique out of those comments.
Q. Do you know any of the individuals that were part of the reviewing group?
A. Mark Davis, Philip Tucker, Marty Weigert, and -- well, that's it that are on the study section.
Q. Do you know what criteria, if any, are used for selecting individuals to be part of a study section?
A. Well, at NIH a study section or review group is formed around a topic that -- or an area, a field of research. In this case, it's allergy and immunology study section. There's actually quite a few study sections in the whole structure of the review branch that deal with immunology, but this would be immunology with a slant towards allergy.
And the people in that area are selected by, mostly by the secretary who reads the literature and makes a judgment of people that might be good contributors to those

study sections and then gets them to agree to be on a study section for a term of, I think it's three years. I've actually never been on a standing study section. I've been on many ad hoc ones.
Q. Now, the critique that's set forth at page 2 of Smith Exhibit 6, to your understanding, to what extent, if at all, is that a consensus view of the study section?
A. In the study section there's -- one member of the study section is designated as a primary viewer. And depending on the particular study section, one or two are designated as secondary reviewers. Each of those writes the comments for the particular -- for that particular proposal.
And the comments on the -- in the -- the summary statement, the critique in the summary statement would be very influenced by the comments of the primary and secondary reviewers. So it would be a consensus of them.
And they're very strictly asked to reflect what the consensus of those reviewers is. Now, they're supposed to take into account the views of other members of the study section as well because every proposal is also discussed in the meeting with the primary viewers and the secondary reviewers presenting them in open discussion. Though that's usually pretty brief. I mean, I would, of course, have no idea in the case of this particular one.
Q. Now, I note in this critique, about the middle --

A. Of the second page?
Q. Yes, page 2. -- in the discussion of -- is it proteolysis --
A. Uh-huh.
Q. -- of fusion proteins?
A. Uh-huh.
Q. The statement, the following statement is made: "This may be a problem for very large inserts, such as the SCAB" --
Is that the single-chain antibody --
A. Yes.
Q. -- you've testified about?
A. Uh-huh.
Q. -- "moreover, the inserted SCAB moiety may interfere with viral growth. The applicant does discuss many of the eventualities here but the prospect for success is lower. In any case, the SCAB project is a minor part of the proposal."
Did you provide that information that is this last sentence, "In any case, the SCAB project is a minor part of the proposal," or is that a view that the study committee came up with?
A. I think that's more a view of what the study section interpreted it at.
Q. Okay.

A. It was a small number of words in the proposal, but a fairly large amount of enthusiam. So they probably -- but it was still -- I think their interpretation was that this is a fairly minor part of the project.
Q. Now, do you recall providing --
(Mr. Vezeau and Ms. Choi conferring out of the hearing of the reporter.)
Q. As of April of 1990 -- let me.
Directing your attention to Smith Exhibit 9 --
A. Yes.
Q. -- where you indicate that the plasma was received in May, May 21 of 1990, do you see that?
A. Yes.
Q. Okay. As of April of 1990, what work, if any, had been performed in connection with construction of a library of infectious antibodies?
A. None. I didn't start till I had their antibody, referring to physical work. Thinking about it and writing constructs on paper had progressed.
Q. And the work, again, that was performed in your lab was documented in the six laboratory notebooks that no longer can be located --
A. Yes.
Q. -- is that correct?
A. That's correct.

Q. I'm going to place before you a document previously identified as CAT 30(b)(6) Exhibit 22. And first of all, I would imagine you haven't seen this document before, have you?
A. No.
Q. Okay. Dr. Chiswell has indicated that these are notes he prepared after going to the 1992 Banbury Conference where he gave a talk and you said you gave a talk. Do you recall meeting Dr. Chiswell?
A. I'm pretty sure I met him at that time. I met him -- I think it was at that meeting that I met him --
Q. Okay.
A. -- yes.
Q. Do you recall discussing with him your efforts to display an scFv on phage?
A. I'm afraid I don't remember specifically talking about that, but my guess is that I would have.
Q. Okay. I'm going to direct your attention to the top of page 2 --
A. Oh, I'm sorry.
Q. -- of this exhibit --
A. Yes. Okay. Right.
Q. -- and just ask you to read the first three sentences on that page -- or the first two sentences.
A. "George Smith privately is candid that he had

tried and failed to put an scFv from Genex into gene III in '88-'89."
Well, I hope I didn't say that.
"Genex were clearly not over" -- oh, I see. I see. He's saying that I tried but didn't get the gene. Okay. "Genex were clearly not over helpful. Might prove useful to show that early publications were not enabling for antibodies."
Q. Do you remember any such discussion with Dr. Chiswell?
A. I'm a little surprised at this. I mean, I think he's pulling out of the conversation probably a minor part of it. But I may well have said, and I certainly thought at the time, Genex was certainly -- had certainly delayed a lot in giving us the gene.
I would have thought that I would have -- I believe that the sentence is bringing together two, or confusing two things. So the first part of it, "tried and failed to put an scFv from Genex into gene III," that's the sort of thing that I expect I talked to him about, saying what problems we encountered putting a single chain into gene III.
And what he implies in the next sentence was that Genex was not overhelpful and that -- the '88-'89 date would refer to the era where Genex wasn't very helpful because

they didn't give us the gene.
Q. I see.
A. That's my interpretation of that sentence. I mean, I think the sentence is just sort of garbled a little bit from what he really meant to say.
Q. Okay. All right. Do I understand correctly you do know Dr. Kay?
A. Yes.
Q. Brian Kay?
A. Yes.
Q. Do you consider him a credible scientist?
A. Oh, absolutely.
Q. And do you regard -- do you regard him highly in your field?
A. Yes.
Q. If Dr. Kay testified that he attempted to get ahold of you in connection with a draft foreword for the book he co-edited, would you believe that he did make an attempt?
A. And failed?
Q. Yes, apparently.
A. Yes, I think that's entirely credible.
(Mr. Vezeau and Ms. Choi conferring out of the hearing of the reporter.)
Q. I'm going to place before you a document

previously marked as -- is this Kay 24? -- Kay Exhibit 24. This was an exhibit marked during his, Dr. Kay's, deposition.
And, first, if you'll take a look at, I'd like to know if you've seen this document before?
A. If I didn't see it yesterday, I don't think I have. I saw a lot of documents yesterday and this might have been one of them, but I don't remember.
Q. Okay. For your information, this particular declaration was filed in connection with a refutation of arguments made by opposers in the European patent office to the European McCafferty application. Did all that make sense to you?
A. Yes. Yes, it does.
Q. All right. What I'd like you to do is please read -- and you're welcome to read any part of this you want, but I would like you to read paragraphs 13 through 17, which concern your -- well, paragraph 16 gets to your grant application. And, basically, when doing that, I'm going to want to know if there's anything in Dr. Kay's declaration you would disagree with,
MR. HARTH: I'm going to object to the extent you're asking the witness to offer an expert opinion.
If the request is, are there any factual matters that are incorrect, I don't have a problem with that. If the question is, do you have an opinion that is in

opposition to the opinions expressed by Dr. Kay, I would object to that.
BY MR. VEZEAU:
Q. So you understand my question, I would like to know if there are any statements made by Dr. Kay that you disagree with in paragraphs 13 through the end?
MR. HARTH: Including statements of opinion?
MR. VEZEAU: David you stated your objection, period. If you have an objection, state it.
MR. HARTH: I'm asking you to clarify. If you don't want to do that, that's your choice.
MR. VEZEAU: I said all statements.
MR. HARTH: Including opinions?
MR. VEZEAU: I'm not going to sit here and debate with you.
MR. HARTH: I'm asking you, sir.
MR. VEZEAU: I view these as statements, period.
MR. HARTH: I'm asking you, sir.
(Witness is reading.)
BY MR. VEZEAU:
A. I think these -- these statements are all about opinions. I'm not sure if there is anything factual that's at issue here. So you're really asking my -- whether this reflected my own opinion now or then?

Could you be a little more specific of what it is you're asking me to comment on here.
Q. Sure.
A. I mean...
MR. HARTH: I'll also object on grounds of multiplicity. If there are particular statements, as you like to call them, that you'd like Dr. Smith to comment on, I suggest that you call his attention to those statements rather than six or seven paragraphs containing probably seventy or eighty different statements.
MR. VEZEAU: Are you through? That, again, is a speaking -- it's not an objection; it's a brief.
And I'd ask you once again, David, to please cut it out because I have a limited amount of time and I want to get through with this witness. So please stop.
BY MR. VEZEAU:
Q. Let me ask it this way. Do you know -- do you have any reason to believe that Dr. Smith -- I'm sorry. Let me try that once more.
Do you have any reason to believe that Dr. Kay is not a truthful man?
A. No, I have no reason to believe that at all.
Q. Okay. Do you -- I'll withdraw that partial question.
Now, MorphoSys apparently sent to you MorphoSys

arguments made to the European opposition division in connection with the McCafferty application. Do you recall that correspondence from Mr. Harth?
A. Yes, I remember receiving those arguments.
Q. I'm sorry.
A. Go ahead.
Q. Okay. Did you ever receive from MorphoSys the decision of the European opposition division in connection with the European McCafferty --
A. I don't know if I received that decision.
Q. Did you ask for it?
A. I don't think I asked for it.
MR. VEZEAU: I'll ask the reporter to mark for identification as Defendant's Deposition Exhibit 319 documents produced from the files of MorphoSys bearing production numbers M11705 and 11706.
(DEFENDANT'S DEPOSITION EXHIBIT NO. 319 WAS MARKED FOR IDENTIFICATION BY THE REPORTER.)

BY MR. VEZEAU:
Q. Dr. Smith, I'm going to hand you deposition Exhibit 319 and ask you to take a look at it and then basically verify that this is a letter that you prepared.
A. Yes.
Q. You refer in the first sentence to your having

been approached by numerous colleagues. Who were the colleagues, other than Dr. Vimekas?
A. I would have a hard time saying who, specifically.
Q. Do you believe there was anyone else other than MorphoSys at that time?
A. I'm afraid I don't know, actually. I'll just have to plead lack of recall. I guess there were enough inquiries that prompted me to write this letter, sort of a form letter.
Q. Now, with this form letter, you say, "To this end I enclose copies of two grant proposals submitted to NIH." Do you see that?
A. Yes.
Q. Is this the first time you can recall sending out copies of these grant proposals to anybody requesting it?
A. Oh, no, I'm sure I sent the grant proposal to other people. But I would have -- I wouldn't be able to tell you specifically who, just on my own.
Q. Do you have any records that show that?
A. No, not that I have found. I guess not that you found in those files.
Q. Do you have any recollection of who you sent them to or when you sent them?
A. I'm afraid I don't. You mean this -- these -- under this cover letter, you're talking about?

Q. Whether under this cover letter or a different cover letter.
A. I don't. I sent some proposal to -- I know I sent one proposal to Bob Ladner. And that would have been pretty -- that would have been early in the nineties, I'm sure. And I don't remember which one it would be, actually --
Q. Okay.
A. -- whether it was the one that I submitted in '87 or the one I submitted at the end of 1988.
Q. You state in the fourth paragraph that, "As you'll see if you read the account, it's very hard for anyone, including me, to take serious credit for the 'invention' of anything in this field!" Do you see that?
A. Uh-huh. Yes.
Q. Now, you indeed were pursuing, though, a patent along with Enzon to attempt to obtain coverage, broad coverage, that would encompass the display of SC antibodies, single-chain antibodies, on living organisms; isn't that correct?
A. That's correct.
Q. Do you recall in the document you produced yesterday --
A. Is --
Q. -- which was a draft patent application that you were working on with Enzon, that you made numerous suggested

changes to that draft application?
A. So this was the draft that we are withholding, that--
Q. Yes.
A. -- Mr. Hoskins has?
Q. Yes.
A. And I enumerated --
Q. The pages.
A. -- the pages on which those amendments or those suggested editings were done, yes.
Q. And one of the pages you enumerated was page 40. I don't know if you remember that?
A. (Shrugging.)
Q. But do you recall striking reference to the McCafferty paper on page 40?
A. I can't remember.
Q. Okay.
A. All I did while I was -- I haven't looked at that in many years. And I was just paging through those and just noting the pages where they were marked. That's all I did while I was glancing through those.
Q. Who is Mats Persson?
A. He's a scientist. I'm afraid I don't know his affiliation.
Q. Karolinska?

A. Karolinska Institute in Sweden.
Q. Stockholm.
A. And he was someone that was involved in display of protein domains on living organisms. I mean, he sort of was in that general field and interested in that general field.
Q. Let me ask you, you've use the term "domain" throughout your testimony here today. What do you mean by the term "domain"?
A. Well, domain in proteins means a part, a subpart, of the protein, not the entire protein, that folds up and can act pretty much autonomously apart from the other parts of the protein.
THE REPORTER: Excuse me. Pretty much on...?
THE WITNESS: Autonomously apart from other parts of the protein..
A. So, for example, an antibody as it's usually made has two so-called Fab domains that are about a third of the antibody each, and each of them is able to bind to antigen. And then there is another domain called the Fc domain. And each of them can be sort of separated from the others and retain its structure and some of its functions.
Q. Have you used the term domain in connection with peptides?
A. Have we ourselves, for my own publications? I can't remember using -- talking about that except -- yes,

very recent publications have talked about peptides that can form self-sufficient domains, sub-domains.
Q. Candidly, I thought you used that term this morning when the topic was peptides. And that's the only reason I asked it because I thought -- I had a different impression what domains were. So I'm wondering how you use that term.
MR. HARTH: Well, I'm going to object to counsel's speeches about his understanding of the testimony.
MR. VEZEAU: Fine.
MR. HARTH: What is the question?
MR. VEZEAU: You heard the question.
Would you please read it back?
THE WITNESS: I was --
MR. VEZEAU: Could you read the question back?
BY MR. VEZEAU:
Q. Let me ask it this way. Is that term used loosely by you or very strictly by you in your discussions?
A. I was using it loosely in that context. And I would use it much more strictly when the confirmation of a complex displayed peptide was at issue. So I was using it loosely in that -- when I was talking about peptides.
MR. VEZEAU: I'm going to ask the reporter to mark for identification as Defendant's Deposition Exhibit

320 documents produced in this litigation.
(DEFENDANT'S DEPOSITION EXHIBIT NO. 320 WAS MARKED FOR IDENTIFICATION BY MR. VEZEAU.)

BY MR. VEZEAU:
Q. You certainly saw this yesterday; is that correct?
A. Yeah. From Mats Persson, yeah.
Q. Now, do you recall the phone conversation referred to on the third page of this exhibit?
A. No, I am afraid I don't recall it.
Q. Now, in the second paragraph on the third page, to see if I can refresh your recollection, I want to read this portion of that paragraph:
"GPS admires (sic) Ladner and is positive that he independently and early on had the ideas presented in the patent. Still, GPS opposes the principle that biotechnology patents can be issued without having to reduce the ideas to practice: Ladner had the idea but chose the wrong phage - it would not have worked, and only by adding things to the... application did it end up having sufficient substance."
Does that accurately reflect your view as of that time frame, 1997?
A. Yes, I think that -- that's my -- how shall I put it? -- my majority opinion. I don't think I'm always consistent, but that would be -- that would certainly be the

way I would usually -- the opinion I'd usually have on this subject.
Q. Now, the Ladner referred to in the patent -- or the original application, what, if any, relationship did that have to the application in which you were named as a co-inventor?
A. Well, I believe that the application that I was added to as a co-inventor derived from that original Ladner patent. That certainly is my understanding.
Q. And is -- now, you indicate -- well the statement is made that "only by adding things to the original application did it end up having sufficient substance." Do you recall what was added to the original application?
A. Well, that would be by citing other people's work that reduced -- that could arguably be said to reduce the -- Ladner's idea to practice. And that would also refer to my own work.
Q. Your work on what?
A. On single-chain antibodies displayed on filamentous page. The work with the anti-fluorescein antibody.
Q. And that's the work in the lab books that were lost in the mail?
A. Yes.
Q. What do you mean by "reduced to practice" in your

last answer? And if you'd like, we'll have the reporter read it back.
MR. HARTH: Would you read it back, please.
MR. VEZEAU: Yeah.
THE REPORTER: I'm sorry, what am I reading back?
MR. VEZEAU: Just his last answer.
THE REPORTER: His last answer?
MR. VEZEAU: Yeah. Please.
(The reporter read the answer as follows:
"ANSWER: On single-chain antibodies displayed on filamentous phage. The work with anti-fluorescein antibodies.")
MR. VEZEAU: I think there's --
THE REPORTER: Did I read that correctly?
MR. VEZEAU: Yeah, that was fine, but there's more that preceded that, I think. It's a longer answer.
THE REPORTER: I'm sorry. The answer that preceded that was:
"ANSWER: Well, that would be by citing other people's work that reduced -- that could arguably be said to reduce the -- Ladner's idea to practice. And that would also refer to my own work."
BY MR. VEZEAU:
Q. Yeah. And that's what I was wondering, what you

meant by that term "reduced to practice" as you used it?
A. In that context, Ladner put forth the general idea of displaying foreign things like single-chain antibodies on living organisms, and he would include phage and other viruses in that context.
But he didn't propose -- he didn't cite any actual experiments showing that that could be accomplished. So reduction to practice in this -- what I meant by reduction to practice was doing an actual experiment that showed, in principle at least, that this display could be accomplished.
Q. (Nodding head.) Now I'd like to direct your attention further down to -- on this page where it states, "GPS has gone through his date books from 1988, but has no record or memory of any public appearance, or publishing any text, during this time at which he may have presented his ideas."
Do you know to what that is referring?
A. Give me a second.
Well -- any public appearance, or publicizing any text, during this time at which he may have presented his ideas.
Looking at that, it looks like I meant that I didn't go to a meeting, like a public meeting. But I did make visits in 1988, as you well know. So I guess that's what I meant there.

And "presented his ideas," this must mean -- be referring to the idea of what I call the epitope library because I wouldn't, certainly, have been presenting any ideas concerning phage antibodies in 1988.
Q. GPS -- the next statement: "GPS would support an opposition solely on the grounds to oppose the fact that the ideas had not been reduced to practice; he is not willing to personally support an opposition based on other aspects."
Do you know what opposition is being referred to here?
A. You know, I'm afraid I don't. I don't know what opposition. This might be an opposition to a Ladner patent is my guess because Ladner -- and that's probably what Mats was asking me about. This is a communication from Mats Persson to Cambridge Antibody Technology?
Q. Sean Walton, who is outside British counsel for Cambridge Antibody.
A. Uh-huh. Well, I don't recall the conversation with Mats and I -- my guess would be about the Ladner patent on, you know, most aspects of phage display. He has an issued patent in the U.S., and I don't know about in Europe, that broadly covers display of things on filamentous phage.
But certainly nothing -- Ladner can't touch single-chain antibodies. When he left the company, he had to sign some kind of --

THE REPORTER: When he left the company...?
THE WITNESS: He had to sign some kind of undertaking not to deal with single-chain antibodies. At least, that's my understanding.
BY MR. VEZEAU:
Q. Do you know with -- under the Genex agreement, in connection with the provision of the single-chain antibody from Genex to the University of Missouri and to you, you were obligated to report any significant research results in connection with that single-chain antibody? And that's report back to Genex?
A. I believe I was.
Q. Okay. Did you do so?
A. I believe I did. I'd have a hard time documenting that, though.
Q. Did you see anything in the files that you produced for us yesterday along that line?
A. You know, I didn't look at those files and I haven't looked at them for years.
Q. All right.
(Mr. Vezeau and Ms. Choi conferring out of the hearing of the reporter.)
MR. VEZEAU: We can take a minute or two breather.
(Off the record.)

MR. HARMON: Back on record.
MR. VEZEAU: I'm going to ask the reporter to mark for identification another document from your files that you produced here yesterday. And this will be Defendant's Deposition Exhibit 321.
(DEFENDANT'S DEPOSITION EXHIBIT NO. 321 WAS MARKED FOR IDENTIFICATION BY MR. VEZEAU.)

BY MR. VEZEAU:
Q. I'll hand that exhibit to you, Dr. Smith, and ask you to review it and tell us what that is, if you can.
A. Well, it's obviously a review of the Breitling, et al., paper, also after McCafferty, et al., displaying antibodies on phage.
I'm pretty sure that I didn't write this review. And someone sent it to me, I would guess, asking for comments.
Q. Okay. Do you know, there are a bunch of letters on here and a bunch of numbers, handwritten. Do you know what they mean?
A. That's typical doodling, so I don't think they mean anything.
Q. Is that your writing?
A. Yes, that's my writing.

Q. Okay. So you did see this, apparently, at one stage. And do you believe you reviewed it?
A. Yes, I think I looked at this.
Q. Okay. But you don't recall -- do I understand from your testimony you don't recall who sent this to you?
A. No, I don't.
Q. Okay.
MR. VEZEAU: Okay, let's take about a five-minute break. And I'm going to try to wrap up rather promptly.
(Recess.)

MR. HARMON: Back on record.
BY MR. VEZEAU:
Q. Have you, Dr. Smith, met with Dr. Pluckthun?
A. I've seen him at numerous meetings, yes --
Q. Okay. Have you had --
A. -- several meetings.
Q. -- any discussions with him concerning the McCafferty patent or the Griffiths patent?
A. I don't recall whether I've talked to him about that subject.
Q. Do you know --
A. I can't remember.
Q. Do you know if you've corresponded with him,

whether in hard copy or electronic form?
A. Not that I know of. I can look in my files --
Q. Okay.
A. -- but I don't think I've found anything to that effect in the e-mail files.
Q. Have you had any discussions with Dr. Barbas concerning either the Griffiths patent or the McCafferty patent?
A. Again, not that I can remember.
Q. The same question with respect to Dr. Burton, have you had --
A. Dennis Burton?
Q. Yes.
A. Again, I can't remember talking to him about that subject.
Q. Okay. Have you had any discussions with Dr. Von Ruden or correspondence with Dr. Von Ruden in connection with either the McCafferty or Griffiths patents?
A. Von Ruden, R-u-u-d-e-n?
Q. R-u-d-e-n.
A. I can't remember him, even.
Q. All right.
A. I'm sorry.
Q. Okay.
A. So I don't --

Q. Do you remember, have you ever met Simon Moroney?
A. Simon Moroney? Again, I can't remember.
Q. Do you know if you've had any correspondence with him?
A. Not that I remember.
(Mr. Vezeau and Ms. Choi conferring out of the hearing of the reporter.)
Q. As you sit here today, Dr. Smith, do you recall precisely what you said at the April 1990 Banbury Conference in your 15-minute presentation?
A. Precisely?
Q. Yes.
A. You mean word for word?
Q. Yes.
A. No, of course not.
Q. Did you ever make a library of single-chain antibodies displayed on phage?
A. No.
MR. VEZEAU: Dr. Smith, my turn is over. It's now Mr. Harth's turn to ask you some more questions, so listen up!
MR. HARTH: I only have a few.

RE-EXAMINATION BY MR. HARTH:
Q. Dr. Smith, did Mats Persson inform you that he had

been asked by the attorney for Cambridge Antibody Technology to seek out your views?
MR. VEZEAU: Objection, lack of foundation.
BY MR. HARTH:
A. I don't remember.
Q. Did you know that Dr. Persson was in communications with Sean Walton, the attorney for Cambridge?
A. I don't know now whether I knew it. I might or might not at the time. I didn't -- I don't know.
Q. All right. Did you know that Dr. Brian Kay was a paid expert for CAT?
A. When are you asking when I knew that?
Q. At any time. Before today, but did you know that?
A. I -- it didn't register with me before today. If I knew it, I had forgot it.
Q. All right. In your "Dear Colleague" letter of June 27, 1997, Exhibit 319, at the bottom of the page -- actually on the second page you say that "I believe that Banbury has a rule that talks given there are to be considered, quote, personal communications, unquote." What does that mean?
A. That means that if you write a paper, you can't cite a talk at a Banbury Conference as a reference. For example, it must be cited as personal communication. And for personal communication, of course, you have to have the permission of the communicator.

Q. All right. Are you aware of any rule or custom followed by the organizers of the Banbury Conference that prohibits participants from discussing the substance of the meetings with people who weren't there? I.e., could you go and tell Dr. Scott when you got back what happened, or would you be violating the rules?
A. I don't think I would be violating the rules, not that I was aware of, anyway. I don't think there are any such statements. I doubt it.
Q. Mr. Verzeau showed you a memo by a David Chiswell which is an account of a conversation he had with you at the Banbury Conference. The first sentence says that George Smith privately is candid that he had tried and failed to put a single chain from Genex into gene III in 1988-89. Do you see that?
A. Yes.
Q. Did you have a single-chain Fv from Genex in either 1988 or 1989?
A. No. I think the meaning, his meaning, there was not -- is not expressed by the words. But I think what he meant was that I tried to get the gene in '88-'89, Genex wasn't very helpful. And then, in addition, when I finally did get it, I tried to display and wasn't very successful, in my eyes.
Q. All right. And you say wasn't very successful in your eyes. What do you mean by that?
A. The single-chain antibody could be displayed on the surface of the phage. I think we demonstrated that. But its binding specificity was rather marginal, to our interpretation. It performed -- the discrimination in a tight control was about a hundredfold. Discrimination between specific and nonspecific finding was about a hundredfold, and we were used to discriminations in the epitope library clones in the order of a millionfold. So we considered a hundredfold as quite marginal performance.
And we also regarded -- the single-chain antibody that we displayed did reduce the yield of phage and the infectivity of the phage. So the phage -- as phage, the phage performed less well than wild-type phage or phage displaying a short peptide.
Q. But you did, in fact, display the antifluorescein antibody on phage as you reported to the NIH in your progress report?
A. Yes.
Q. Are the pink sheets that you get from the NIH reviewers available to the public, to your knowledge?
A. No, I think not. You can get the study section composition, but you can't get the comments.
Q. All right.
(SMITH DEPOSITION EXHIBIT NO. 23 WAS MARKED FOR IDENTIFICATION BY THE REPORTER.)

BY MR. HARTH:
Q. Let me show you what we've marked as Smith Deposition Exhibit 23.
A. Okay.
Q. This is a -- on its face, at least, a fax message to you from David Chiswell, dated July 21, '95. Do you see that?
A. Yes.
Q. Do you have a recollection of Dr. Chiswell asking you to provide an expert opinion for an auction in the European patent office?
A. I'm afraid I do not recall. Actually must have -- I think he was at a meeting in Italy earlier that summer that I was at. I do not remember what I replied to this. Well, I'm pretty sure I would have replied that I wasn't -- wouldn't act as a witness on their side.
Q. All right. Do you have any recollection of, in fact, acting as a witness on CAT's side?
A. No, I didn't. I didn't. I would have remembered that.
(SMITH DEPOSITION EXHIBIT NO. 24 WAS MARKED FOR IDENTIFICATION BY THE REPORTER).

BY MR. VEZEAU:
Q. Showing you Smith Exhibit 24 --
MR. VEZEAU: May we see that?
MR. HARTH: Yes. It's in your pile.
Q. Before you go through that, do you know what position the patent office took with respect to the statements that you made in your declaration?
A. Which declaration are we talking about?
Q. We're talking about the declaration in connection with the --
A. Ladner 87?
Q. Yes, that Mr. Verzeau was asking you about. And I think it's Defendant's Exhibit 317.
A. Well, this patent was denied and ultimately abandoned. And I'm afraid I do not know where in the chronology this comes. So I -- the patent was denied and the Goldstein -- I mean, Stern, et al., and Enzon didn't ultimately abandon the patent.
Q. Do you recall ever receiving a copy of Smith Deposition Exhibit 24, an office action, following your submission of your declaration?
A. So this is their action, is that --
Q. Says "office action" on the front page. And I'll represent to you that this comes from your files.
A. Okay. So, obviously, I received it. But I -- so

I received it, yes.
Q. Do you have any recollection of reviewing it or what it says?
A. I don't.
Q. All right. Mr. Verzeau asked you about a fax that I sent you, DDX 315, which has a multi-page submission attached in connection with the opposition proceedings in the European patent office on the McCafferty patent. Simple question: Did you ever read this document?
A. I read parts of it, yes, I did.
Q. Now, you mentioned in your earlier testimony that you had offered the attorneys for CAT the opportunity to meet with you privately yesterday?
A. Yes.
Q. Did they take you up on that offer?
A. Yes.
Q. Did you meet yesterday with Mr. Verzeau and Ms. Choi and Mr. Clough?
A. Yes.
Q. How long did that meeting last?
A. A little bit less than two hours.
MR. HARTH: That's all I have. Thank you.
MR. VEZEAU: Just one second. You're almost free.
(Off the record.)

MR. HARMON: Back on record.
MR. VEZEAU: Dr. Smith, thank you for your kindness both yesterday and today. And for your patience here today. It's been a long day. We do thank you, though.
THE WITNESS: You're welcome.
MR. HARTH: Thank you.

(Defendant's Deposition Exhibits Nos. 313 through 321 were re-marked for identification by the reporter.)

(Signature on next page.)

DEPONENT: George P. Smith, pH.D.
VENUE/CASE NO.: U.S. Distsrict Court Case No. 1:00CV00146
DATE: May 14, 2002

George P. Smith, pH.D.

Subscribed and sworn to before me this _____ day of _____, 2002.

My commission expires _____.

Notary Public, State of Missouri

CERTIFICATE

STATE OF MISSOURI)
) ss
COUNTY OF COLE)

I, Sally Bredeman Harmon, Certified Court Reporter of the firm of Bredeman & Associates, Inc., a Notary Public of the State of Missouri, commissioned in Cole County, do hereby certify that pursuant to agreement there came before me on May 14, 2002,

George P. Smith, pH.D.,

at the offices of Davis, Susan & Holder, in the City of Columbia, County of Boone, who was first sworn by me to testify the whole truth of his knowledge concerning the matter in controversy aforesaid; that he was examined, and his examination then and there was written in machine shorthand by me and afterwards transcribed by computer-aided transcription and is fully and correctly set forth in the foregoing 188 pages; that the reading and signing of this deposition was requested by counsel and the witness; and this deposition is herewith returned.

I further certify that I am neither attorney or counsel for, nor related to, nor employed by any of the parties to this action in which this deposition is taken; and further that I am not a relative or employee of any attorney or counsel employed by the parties hereto, or financially interested in this action.

Given at my office in the City of Jefferson City, County of Cole, State of Missouri, this 16th day of May, 2002.

My Commission expires February 26, 2005.

_____
Sally Bredeman Harmon, CCR
Notary Public, State of Missouri
Commissioned in Cole County

COURT MEMO
IN THE U. S. DISTRICT CCOURT
FOR THE DISTRICT OF WASHINGTON, D.C.

MORPHOSYS AG, Plaintiff,)
vs.) Case No. 1:00CV00146
CAMBRIDGE ANTIBODY TECHNOLOGY, LTD., Defendant.)

CERTIFICATE OF OFFICER & STATEMENT OF COSTS INCURRED

DEPONENT: George P. Smith, pH.D.
(taken on behalf of Plaintiff)
DATE OF DEPOSITION: May 14, 2002
CUSTODIAN OF THE ORIGINAL TRANSCRIPT: David J. Harth
1666 K Street, NW, Suite 300
Washington, D.C. 20006
TAXED IN FAVOR OF:
PLAINTIFF, represented by David J. Harth:
Appearance, original and one copy of transcript, jurat, index, ascii disk, signature, videotaping, delivery,
Total.....$_____
DEFENDANT, represented by Timothy J. Vezeau:
Copy of transcript, condensed copy, index, ascii disk, copy of videotape, delivery,
Total.....$_____

PAYMENT OF CHARGES:
Upon delivery of transcripts, the above charges had not yet been paid. It is anticipated that all charges will be paid in the normal course of business.

IN AFFIRMATION THEREOF, I have hereunto set my hand on this 16th day of May, 2002.

_____
Sally Bredeman Harmon
BREDEMAN & ASSOCIATES, INC.
527 East High Street (P.O. Box 866)
Jefferson City, MO 65101 (65102-0866)

All-Word Index

Deposition of: George P. Smith, Ph.D. (05/14/02)

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